THE BUILDER

VOL. XCVIII.—No. 3504. APRIL 2, 1910.

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Fire-Resisting Properties of Concrete.

THE question of the suitability of concrete as a fire-resisting material, which for some time disturbed the minds of engineers, resulted in tests being carried out on this material to investigate the results of fire upon its composition—tests which have proved it to be a very suitable material for this purpose when properly constructed and composed of suitable aggregate. Recent fires in buildings have also proved that it is capable of resisting the fire even where the metal casement-frames have been injured.

The recent report of Mr. R. L. Humphrey of tests carried out by him in the laboratories of the United States Geological Survey, St. Louis, on the behaviour of thirty panels of various materials, tested with a gas furnace in the Underwriters' Laboratory, Chicago, brought out most clearly the low transmission rate of Portland cement mortars and concretes. The tests were very severe, and none of the materials passed successfully through the ordeal of fire and water applied, but the temperatures used were probably greater than ever obtain in an actual fire.

The furnace used had an arched opening, 6 ft. by 9 ft., the materials under test being built within it as a wall; the fire, which was a gas fire, played on the back. The temperature varied between 1,400° Fahr. and 1,700° Fahr., the latter being the general heat applied. This lasted for two hours, after which the wall was withdrawn, being built previously on rollers specially for the purpose, and water at 50 lb. per square inch from a $\frac{7}{8}$-in. nozzle was played on it for five minutes.

The materials tested included building blocks of river and slag sands; common, sand-lime, and hydraulic-pressed bricks; concretes of gravel, cinder, limestone, and granite aggregates; glazed bricks, partitions, terra-cotta tiles, sandstone, limestone, granite, and marble building stones. The bricks were common bricks bought in the open market, the concrete being made in the structural materials-testing laboratories; the tiles were also bought in the open market. Under the tests all the materials cracked more or less, but the concrete tested cracked least of all, though the tests showed that metal reinforcement is necessary to more equally distribute the effects of expansion. The low heat transmission rate of the concrete made with Portland cement, shown by the tests, is a very desirable quality; and as a further proof of this the linen tags that were fastened to the interior of the walls by wire nails remained undamaged at the end of the test in every case.

Taking an average of all the tests, the temperature attained by the faces of the walls in one hour was 90 per cent. of the maximum temperature, and in the case of the mortar blocks the total increase in temperature of the panel backs in one hour was about 20 per cent. of the total increase in two hours. Of the solid concrete, the cinder concrete showed the smallest increase of temperature at the back, and the greatest increase was shown by the granite concrete. The brick panels also showed a very low increase in temperature, though the tiles and natural building stones proved poorer non-conductors of heat. The water of crystallisation being driven off at about half the maximum temperature was probably the cause of the damage done to the faces of the concrete and mortar panels.

The tests showed that the ordinary webs of hollow blocks are insufficient to resist the stresses set up by the fire in these tests; the rapid rise in temperature and the later quenching by water of one of the faces caused the webs to split. The richer the mortars the better the blocks of which they were composed resisted the test, and also the water used in mixing influenced the test. The greater the quantity of water the better the test result. Dry mixtures containing the greatest amount of sand were the constituents of those blocks that showed the greatest amount of spalling or cracking, and from the results it is apparent that the cause of weakness of hollow cement blocks was the weakness of the concrete, a lean mixture being also too dry; and the thinness of the webs afforded too little strength to resist the stresses set up in the material of the face. Therefore, the webs should be made thicker than at present, and the condition of thinness failure will be obviated.

Due to the conditions of the test, the faces of limestone, gravel, granite, and cinder concrete suffered from the application of the water jet, the pitted surface due to the fire being washed away by the jet. To the cinder this was an especially unfair test, for the cinder concrete was very poor, having a large percentage of coal in it, which, of course, burnt under the intense heat of the fire, leaving the surface of the concrete very rough and badly pitted. The granite concrete was probably the best; the damage in no case extended very deeply, perhaps the maximum being $1\frac{1}{2}$ in. It, however, split and broke away from the face. The limestone calcined at the face, as was to be expected from a knowledge of its structure. As previously mentioned, however, the granite concrete had the greatest increase in temperature at the back of the wall. Of coke breeze concrete

and its dangers in use in building construction a paper dealing fully with the various aspects was read this year before the Society of Architects, to which the reader can refer.

The natural building stones were seriously damaged. The partition tile suffered by softening of the face under the water test, large quantities being washed away, and the material became so soft as to be easily crumbled between the fingers. There was a rapid rise in temperature at the back, and a few minutes after the test had started the plaster at the back fell off. The brick panels probably gave the best results, old used bricks and new bricks being employed. Of the old bricks, 60 to 70 per cent. were not damaged, and 50 per cent. of the new bricks were split, the trouble seeming to be knots of lime in the new bricks, as these were found at the bottom of nearly all the cracks.

The concrete blocks tested were pieces of broken beams, 8-in. by 11-in. section, and in various lengths, fired with the 11-in. face exposed. The four aggregates of which these beams were types were made with limestone, granite, cinder, and gravel passed through 1-in. sieve, but retained on ¼-in. sieve; the proportions of mixture being the same in each type—1 of cement, 2 of river sand, and 4 of aggregate, mixed to a medium constituency; the concrete blocks being beams broken up after testing as such in the laboratories. The facts established by the tests are well worth making use of, and the result shows that steel should be embedded 1½ in. beneath the surface where exposure to fire is greatest—at window openings, the underside of floors, etc.

EARNINGS AND HOURS OF LABOUR IN THE BUILDING TRADE.

THE Board of Trade has recently issued a Report, the result of an inquiry into the earnings and hours of labour of workpeople engaged in the building and woodworking trades, on the same lines as the Reports already issued relating to the textile and clothing trades. We shall confine our observations to the statistics concerning the building trade proper. According to the Census of 1901, the number of persons engaged in the building and allied trades was 1,123,418 in the United Kingdom; 945,184 in England and Wales. About 11 per cent. of the above were employers or persons working on their own account, leaving about 1,000,000 workpeople, of whom about one-third were bricklayers, one-third masons, with their respective labourers, and one-sixth painters, decorators, and glaziers. The Report is based on returns relating to about 12 per cent. of the wage-earners, but, owing to the prevalence of standard time rates of wages, and to the fact that nearly all persons in the building trade are paid by time, the Department considers sufficient returns were received to ensure accurate results. The statistics as to earnings are based upon a return showing the number of workpeople employed and the total amount of wages paid in the last week of each month of 1906, together with the total wages bill for the year, and a return showing the individual earnings of workpeople in one ordinary week during the summer, but in the Report particulars are also given as to the winter months. The average hours constituting a full week at full time for men, exclusive of overtime and mealtimes, was 52·9 in summer, 45·9 in winter, the wages averaging 33s. in summer, 28s. 8d. in winter. Both the average hours of work and the average wages vary in the different districts, and the tables contain the fullest particulars with information also respecting the particular grades. In view of the depression in the trade, one of the most interesting tables is that which gives the percentage of men who worked full time, less than full time, and more than full time in the summer of 1906. The figures are given for various districts and for towns of varying size, but for the United Kingdom in all towns they are as follows:—Full time, 49·9 per cent.; less than full time, 28·9 per cent.; more than full time, 21·2 per cent. Owing to the intermittent character of the labour, it is pointed out the percentages may not be absolutely accurate. There appears to be no corresponding table relating to the winter months.

The Report contains some interesting particulars as to seasonal fluctuations in the number of workpeople employed and in average earnings. A rise in both takes place from January to May, falling in June and July to below the level in April, rising in August to the May level, and then declining to the end of the year.

The only previous inquiry relating to the building trade was that made in 1886, and it is stated in the Report that exact comparison as to the rates of wages cannot be made between the two Reports owing to the limited scope of the former Report; but by a comparison of the rates of wages paid in a long series of years the following information is given:—During the period 1884-1888 wages were practically stationary, in the years 1889-1900 an advance of about 18 per cent. took place, and the general level of wages has since remained unchanged.

The Report is full of interesting information, but with the space at our disposal we have only briefly attempted to indicate the character of the matter dealt with. It will be seen that the statistics only relate to those workpeople in employ, and that the Report does not throw any light on the continuous lack of employment which has been the serious feature in the building trade during a long course of years.

NOTES.

London Fires. THE first annual Report of the Chief Officer of the London Fire Brigade contains some interesting figures. The total number of fires attended by the Brigade in 1909 was 3,197, or forty-one fewer than in 1908. The causes of the fires is of interest, as many of them were the result of sheer carelessness. Amongst these may be classified 698 fires caused by lights carelessly thrown down; 202, children playing with fire; 129, mishaps with candles; 90, curtains coming in contact with gas lights; 92, upsetting mineral oil-lamps; 73, ironing linen. Amongst this class may also be placed eleven fires caused by seeking for an escape of gas with a light; 234 fires were occasioned by sparks from fires. Fire-guards might have prevented some at least of these. Of fires caused by gas 100 were due to escapes of gas, whilst defective electric currents occasioned 95. Defective construction accounted for some of the fires; thus 72 were due to imperfectly set stoves and 127 to defective flues; swinging gas brackets caused 17 fires; 16 fires were traced to spontaneous ignition, 13 to friction of machinery, 68 to hot ashes, 84 to fat boiling over, 43 to overflow of petrol, 28 to smoking tobacco, 18 to gas stoves. In 288 cases the cause was undetermined, and in this connexion it is interesting to note that the Committee appointed to inquire into the law relating to Coroners and Coroners' inquests has recently reported in favour of the system of fire inquests which at present prevails in the City of London alone, being extended to the country universally. It will be remembered that the City Coroner, in his Report for 1907, advocated this course being adopted (see the *Builder*, July 4, 1908). Taking the number of fires, however, in which, according to that report, inquests were held and the causes were thereby traced, it will be seen that out of 145 inquests the cause remained undiscovered in thirty cases, or, roughly speaking, one in five; whereas the above figures show that the unascertained fires number only one in eleven.

Estimated Cost of Canal Routes. A BLUE Book has recently been issued containing reports by Sir John Wolfe Barry & Partners, with estimates for improving the canal and river routes connecting the Midlands and South Staffordshire with the estuaries of the Thames, Mersey, Humber, and Severn. From Birmingham to Brentford, by a route 128 miles in length for barges of 100 tons carrying capacity, the cost of the improvements, including works (other than water supply), acquisition of property, and compensation, but excluding legal or engineering expenses, is estimated at 4,170,440*l*. From Norton Junction to Trent Falls the estimate is 2,234,330*l*. For barges of 300 tons carrying capacity the above estimates would nearly be doubled. Other routes are dealt with in the reports which will be found summarised in the *Times*, March 25. The total estimated cost of the schemes considered, for barges of 100 tons, would amount in all to about 14,300,000*l*., and on the second standard, for barges of 300 tons, to about 27,000,000*l*., inclusive of supplementary estimates.

Building Materials in Germany. A SERIES of regulations issued by the Prussian Minister of Public Works to the authorities upon whom devolves the supervision of building operations is characteristic of German methods. At the outset it gives the weight of some two dozen different kind of floors, with diagrams illustrating the nature of the construction. The weight of the component parts and the weight to be taken in the computation of stresses are also stated. Then twenty-seven types of

roof construction are described and illustrated. Afterwards comes a section stating the permissible loads on floors and the manner in which roof loads are to be estimated. Very complete data are given as to the weight of building materials and the stresses permitted in such materials. It should be noted that, unlike some regulations in this country, which, being based upon inadequate knowledge, have been made unnecessarily severe by way of safeguard, the Prussian regulations are founded on exact data and permit a great deal of latitude to designers, while insisting upon the point that all work shall be capable of withstanding the stresses involved.

Lateral Reinforcement in Concrete Columns.

ONE of the points requiring attention in the Royal Institute of British Architects' report on reinforced concrete is the influence on transverse reinforcement in columns. The formula given by the Committee is one generally adopted in all countries for the design of compression members with longitudinal bars only, or with longitudinal bars and a negligible proportion of transverse reinforcement. But it takes no account whatever of the more ample provision made by some specialists in the form of circumferential bands, hoops, or links. Many architects and a few engineers are in the habit of requiring that all columns shall be in accordance with the "Royal Institute of British Architects' regulations," quite overlooking the fact that transverse reinforcement is as valuable in its way as are longitudinal bars. The effect of treating a tentative report as if it were a set of perfect regulations is not conducive to sound design, and, so far as columns are concerned, the practice tends to discourage the employment of transverse reinforcement in an efficient manner. This detail of reinforced concrete design has been duly considered in the regulations of the French Government, to which the attention of our readers may be commended.

Electric Glow Lamps.

THE paper by Mr. Lavender on metallic filament lamps which has just been published in the *Journal* of the Institution of Electrical Engineers is of interest to all users of electric light. Many years ago the late Professor Ayrton proved that it was economical to replace carbon filament lamps as soon as they began to get dull; the low efficiency in the later stages of their life increasing the meter bill by a sum which would more than pay for the cost of new lamps. By applying similar considerations to metallic filament lamps, Mr. Lavender finds that, notwithstanding their cost, it would pay to replace them as soon as their light diminishes by 3 per cent. from its initial value. As this small diminution in the light given out could not be detected without elaborate tests, this rule will have to be modified. The increase in the total cost due to using the lamps until they are undoubtedly burning more dimly is very small, and hence a more practical rule is that the lamps should only be replaced when the bulbs blacken or when the lamps become dull. The latter event rarely occurs before the lamp is burnt out. Practical experience has proved that the life of metallic filament is much longer than that of carbon filament lamps. We know of one lamp which lasted over 15,000 hours without becoming appreciably dimmer. Another point in favour of the new lamps is the low temperature of the glass bulbs. In a new tungsten lamp the maximum temperature of the glass is only about 110° Fahr., and after 1,500 hours burning it is less than 150° Fahr. These temperatures compare very favourably with those obtained with carbon filament lamps, which were often so hot that they could not be touched until the current had been turned off for about a minute. Another interesting point in connexion with these lamps is that most of their light is sent out horizontally, the candle-power in the vertical direction being only about one-fifth of the horizontal candle-power.

The Custody of Ancient Monuments.

THE Treasury have appointed Mr. Charles R. Peers, F.S.A., to be Inspector of Ancient Monuments. Mr. Peers is an Assistant-Commissioner upon the Royal Commission on Ancient Monuments (England), and was appointed Secretary to the Society of Antiquaries, London, three years ago. During the past five years he has been the Architectural Editor of the Victoria County Histories series. Under the Act of 1882 the Office of Works have taken over the custody and preservation of many buildings and monumental remains—as, for instance, Richmond Castle, Stirling Castle, and Old Sarum where excavations are now in progress—which whilst in their care remain in the possession of their owners, who however are at the same time inhibited, by the conditions of committal, from making any structural alteration of the monuments without the concurrence of the Commissioners of the Office of Works.

A SARACENIC SCHOOL, JERUSALEM.

IN a narrow alley leading from one of the more important streets of Jerusalem to one of the smaller gates of the Temple area stands a fine niche-headed gateway of red and white limestone, the stalactite ornament of the niche slightly worn by time. Through the doorway, which is, unlike that of most Moslem houses, almost invariably open, appears a little courtyard partly open to the sky and in part covered by a pointed barrel vault with smaller vaults penetrating its eastern and western sides in the stilted fashion of Oriental work. An arch of red and white stones, following the same curve as that of the large vault, divides the covered from the uncovered parts of the court. In the southern wall of the covered part a niche lined with vertical strips of dark and light stone points out the direction of Mecca, and forms almost the only piece of ornament in the court (Fig 1).

Round the courtyard are several doors leading to chambers formerly used as store places and quarters for the gatekeeper of the school, but which are now given up to poor Moslems, who are allowed by the authorities to live in the old building free of rent. In the north-west corner of the courtyard a stone stair rises between walls to an upper story, which is occupied in part in the same manner as the lower, though some of the rooms are ruinous, and daylight is visible through one of the domes. In the west wall of the court, just by the foot of the stairs, is a well supplied with never-failing water, probably connected by a subterranean passage to the great cisterns of the Temple area, which adjoins the building on the east, some of the rooms of the upper story being built over the arches of a cloister

ARCH SUPPORTING FLUE OF BALCONY
BALCONY
DETAIL OF RESPOND
ENTRANCE COURTYARD AND PRAYER NICHE TO A SARACENIC SCHOOL JERVSALEM

Fig. 1.

that skirts the great courtyard on its western side.

The old building was erected as a school in a good period of Saracenic art, probably early in the XVth century, though the people of the place believe that its antiquity is greater than that of its neighbour the "Dome of the Rock." As the latter is a building of the VIIth century, and shows decidedly more Byzantine than Saracenic influence in its construction and ornament, it is evident that their ideas are somewhat at sea.

The chief interest of the place is found in some of the upper chambers and in the ceilings of the stone vaulted staircase (Fig. 2). Several

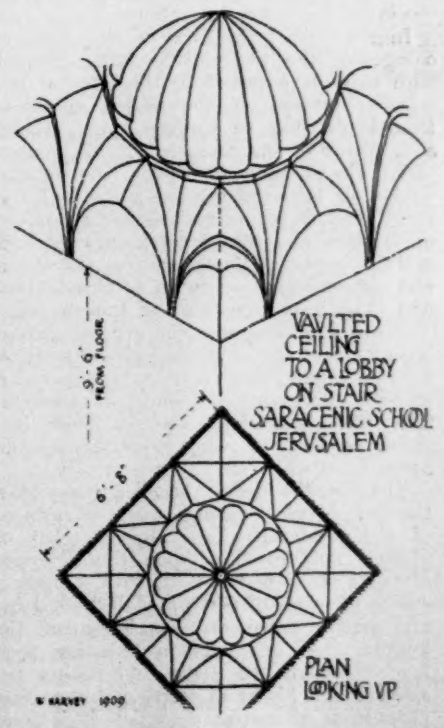


Fig. 2.

curiously ornamented domes and quaintly arranged examples of fan vaulting are displayed in different parts of the building, and delight the architect by their excellent

combination of structural truth and appropriate decoration. One of the larger rooms once used for the school chapel is furnished with a niche similar to that of the courtyard, the arrangement of coloured stones with which it is decorated contrasting pleasantly with the creamy limestone and white plaster which constitute the rest of the work. The roof over the southern part of this chapel is formed by two intersecting pointed barrel vaults which open on the north against an arch forming one of a series of four supporting the pendentives and the dome over the northern part of the chamber (Fig. 3). As

Fig. 3.

in many other domes in Jerusalem, the pendentives are carried to a considerable height above the crowns of the arches, and decrease the base of the dome from a diameter approximately equal to that of the room to about two-thirds of that dimension. The dome is perched upon the pendentives in much the same fashion as the broad central slab of a Gothic fan vault is supported by the lower courses of the conoids.

In the chapel the base of the dome is octagonal, the pendentives being formed with surfaces adjusted to the sides of the octagon instead of the simple spherical triangle familiar to western eyes. Above each corner of the octagon a small pointed niche placed squinch fashion rounds the angles off into the general surface of the dome, and serves as nucleus for a number of fan-like ribs that spread outward and upward, covering the interior of the dome and concentrating attention to this highest and most interesting part of the vaulting. The ribs spreading into the general surface have a most happy effect and give expression to the height and contour of the dome without destroying the effect of breadth. The ribs themselves are in very low relief, as it were mere wrinklings of the surface.

The ribs, the niches, the fillet that girdles the bottom of the dome, and the surfaces of the pendentives are all composed of plaster, not trowelled upon the structure after its erection, but built with it upon a centre of props of earth modelled to shape and pulled down on completion of the building. At one point a hole has been made through the dome and allows the small rough pieces of stone and the large proportion of mortar of which it is composed to be seen, and the thickness of the concrete-like masonry (about 1 ft.) to be measured. It is when the nature of the material is realised that the form of this type of vault is most appreciated; the whole vault is practically cast into shape, the stones being hammered into a thick layer of mortar spread upon the modelled earth of the centre. For convenience in walking on and repairing the roof the haunches of the pendentives are filled up to the level of the springing of the dome, so that by their weight and by the coherence of the material they serve to counteract the tendency of the arches to spread.

The comparative lightness of the central dome, which rises in a little knoll in the centre of the flat roof, indicates that the science of vault construction is as well understood in the East as ever it was by the Gothic masters. In the ante-room adjoining the chapel similar pendentives support an octagonal dome of approximately equal size to that of the one described (Fig. 4). The interior surface of the dome is covered with a series of superimposed niches of plaster instead of the fan-like ribs of the other. Two of the landings on the stone staircase leading to these rooms have also curious vaults, one composed of a little dome with vertical flutings perched upon a series of arcuated corbels, and the other consisting of three conoids as in a Gothic fan vault; one springing from the centre of the longer wall of the lobby is semicircular in plan, the other two, which are only quadrants in plan, springing in the corners opposite. The surface of each conoid is ornamented with ribs, not of the deep-carved Gothic pattern, but V-shaped undulations of the surface, the width and depth of the ribs decreasing from the top of the vault till they disappear at the springing. Between the conoids, which only touch at four points at the crown of the vault, are little spaces, diamond shaped, square, and hexagonal, sunk in the vault; the two smallest roofed with rough slabs, the other three covered with little domes ornamented inside with spiral ribs.

The nature of the vaulting at once invites comparison with Gothic work; the pendentives of the domes and the little ceiling just referred to are extremely similar to fan vaulting at home. It is mainly in the difference of the surface treatment that the Oriental origin is shown. A feeling of breadth and simplicity is always present in Saracenic work, however elaborate the scheme of decoration may be. In contrast

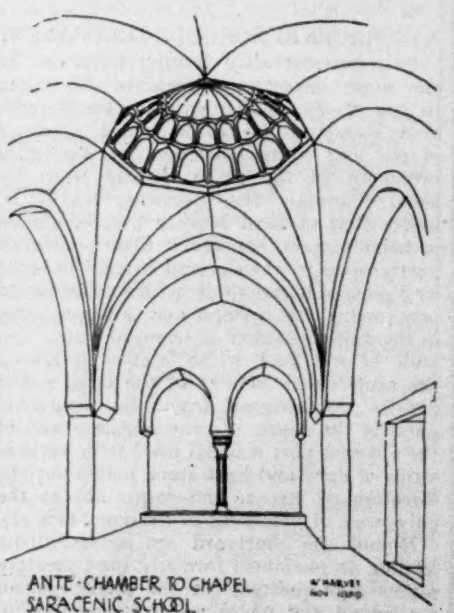


Fig. 4.

to the apparent energy of Gothic structures, Saracenic building-forms possess an interest and dignity due to their assured stability of construction, combined with the charm of carefully modelled contours and consistently elaborated ornament.

WILLIAM HARVEY.

MURAL PAINTINGS IN A BUCKINGHAMSHIRE CHURCH.

IT requires some effort of the imagination to picture the interior of a mediæval parish church, with its rood-screen and its mural paintings, giving to quite a small building an ornateness foreign to the ordinary parish church of to-day. And because they are an aid to the imagination the faint paintings on the walls of Little Hampden Church in Buckinghamshire have a value much beyond any artistic merit which they possess.

Two miles along the main road from Great Missenden to Princes Risborough, opposite the park of the historic house of Hampden, a narrow road to the right breaks into a quiet little valley on the topmost slopes of the Chiltern Hills. Three-quarters of a mile up this road are a group of cottages, a farm, and on a hillock by the roadside the small church of Little Hampden. The porch, of timber and plaster, is noteworthy, with its massive timbers, but we are now concerned with the interior of this little building, for it is only 42 ft. in length and proportionately small in breadth. Up to the year 1907 there was not much of interest to attract the visitor, though, as in most ancient parish churches, some relics of the past, not without value, might be noted. But in this year the remains of mural paintings over the whole of the interior were discovered and exposed to view. It is this completeness which largely gives value to these remains, faint though they are. Because we can picture to ourselves this tiny church in the past much as it appeared many centuries ago.

These paintings were admirably described and illustrated by Mr. C. E. Keyser, F.S.A., in a paper read before the Buckinghamshire Architectural and Archæological Society last year, and now published in the "Records of Buckinghamshire" (Vol. ix., p. 415). It must suffice therefore to say that these paintings appear to have been executed at four different periods; in other words, one generation painted over the work of an earlier generation. The main feature of these drawings is the repetition of the figure of St. Christopher, who is depicted four times. On the north wall he was apparently a figure 10 ft. high, with yellow hair and a red beard. On the same wall to the west of the doorway is an earlier figure, one apparently of the reign of Henry III. These figures are in places mere outlines, in places they are not visible at all, but enough remains of them to give a very exact impression of an insignificant mediæval country church as it appeared to our forefathers. The intensity of the impression is increased by the fact of the remoteness and the rudeness of the building in which these paintings are to be seen, placed as it is in a small valley of the Chiltern Hills, a spot to which in the coming summer days the architectural student may well direct his steps—as the phrase is—with pleasure and profit.

THE CARPENTERS' HALL LECTURES:

COLOURED RELIEFS AND MOSAICS.

THE eleventh lecture of the series of Carpenters' Hall letcures on "Arts Connected with Building," arranged by the Carpenters' Company, was delivered in the hall of the Company, London-wall, E.C., on Wednesday last week, when Mr. R. Anning Bell, R.W.S., lectured on "Coloured Reliefs and Mosaic as Wall Decorations." The Rev. C. B. Bartlett, Master, presided.

Mr. Anning Bell said he proposed to describe two methods of decoration which were suitable to wall surfaces of considerable area, and one of which—mosaic—could not be used to any advantage except over a considerable area. The other, coloured reliefs, it was true, could be quite attractive in small spaces, as in an easel picture, but its proper use, its monumental use, was as a decoration of great panels or friezes on walls of a goodly size. A wall which was

to be covered with mosaic did not need to be so well lit as one which was to be used for coloured relief, which more nearly approached the effect of a wall-painting. In fact, there was no doubt that a mosaic, if it contained much gold, which was the case in all the really splendid mosaics, wanted very little light, and that from small and numerous windows. The small lights round the base of an apse, as in the case of San Marco, Venice, was, he supposed, the ideal result. As a rule one believed that a method of decoration was the servant of, and was, as it were, the child of the style of architecture by which it was developed, and suited no other so well; whereas mosaic was for years used as a decoration of basilicas only. The apsidal ends of these basilicas showed to the more sympathetic architects the peculiar suitability of curved surfaces for the expression of the true glory of mosaic, and the result was the evolution of the Greek cross plan, and the construction of such churches as San Vitale at Ravenna, which, however, was never covered, as intended, with mosaic. Curved surfaces and a dispersed illumination not too strong was the best to express the glory and mystery of mosaic. It should also be considerably above the eye and in considerable quantity, for when it was in small panels it looked quite cheap, and the effect was very trumpery. It was unfortunately quite commonly used for altar-pieces nowadays. Leonardo's "Last Supper" was a favourite subject for this treatment, and the fact that such a great picture produced such an odious result was one of the clearest proofs of the great artistic law that the material in which a work was executed must govern the design. Mouldings were to be avoided when mosaic was used as the decorative dominant factor; it could be taken round the returns of windows or from the wall on to the soffits of arches with the most charming effect. In association with mosaic it was obvious that no other strong colour was wanted; stained glass only fought with it, and painting was too weak. Coloured marble columns and panels with bronze and gilt metalwork seemed to be the best treatment for the spaces below the mosaic.

For coloured relief a wider use was possible; it was not so dominating, and would bear and be helped by the association of other forms of decoration. It could be placed low down, in which case it should be carefully wrought and highly finished; or it could be high up. When large planes and simple surface would give good effect, in the former case the sculptor's work would have much to do with its attraction; and in the latter it was more a painter's work, the relief being used merely to give the total effect a greater strength than it would have if the surface were flat. And it was remarkable how great was the superior carrying power of a slightly raised coloured surface at a distance, where the fact that it was raised was imperceptible; the resulting effect would be one of colour, and the success of the design would depend on the spacing and the colour.

Coloured reliefs of a sort one saw everywhere, but one seldom saw them done by men of personality, of original ideas; they were just pieces of ornament, modelled by one set of men and coloured or gilded by another set. They were not modelled and coloured as one work under the control of one mind, but they were usually chosen as modelling first, and then coloured and gilded in rather a haphazard way afterwards. Now, any colour scheme—any form of decoration, that was—in which the colour was the principal factor, must be designed in colour; a piece of modelling or a drawing of form coloured afterwards was but a timid experiment—not that in past days, when there was a tradition in the arts, it was impossible for one man suitably to colour another man's work in form, for then they had the experience—the workshop, not the text-book experience—of generations to help them. They were all brought up in the same style, and experience had taught them what sort of pattern suited this or that moulding, and what sort of colour arrangement suited the lighting and aspect and altitude of the work they were doing.

Given a definite space or spaces to be treated with coloured relief, and the subject—which should add to the significance of the building—chosen, the next thing was to decide the scale of the figures or ornament, and to get out a sketch of the whole work in colour. The sketch was, of course, but a tentative thing; it settled the distribution of the colour and approximately what the colour is; but watercolour on a piece of paper could not accurately express the effect of work yet to be done on a raised surface; and as for the parts which were to be gilded, gold paint on paper gave but the slightest suggestion of it. Nevertheless, the colour sketch was extremely important, as the shapes of the masses of colour must be decided therein. The colour sketch was practically a map. It was important to decide on the shapes of the colour spaces beforehand in this map, because when they got to the modelling and found the whole surface just a sheet of clay of the same colour the temptation to alter the design was very difficult to resist. The lines which told in the modelling and which, as a sculptor, one was inclined to regard as of the greatest importance to the design, were not always the lines which were the effective ones in the finished work when coloured. And it was the shapes rather than the lines which mattered most at the end. In a relief, say, of a head, one side would hold a shadow and tell more definitely as an outline than the other which receives the light; but when the head was coloured the shadow tells but slightly, while the head as a whole tells distinctly against the background. Parts where the flesh showed were particularly awkward details to treat, and should be very definitely settled in the preliminary sketch; in the nature of the material these portions were sure to show rather distinctly, if a rich or vigorous colour scheme was employed, so that slight alterations which in the clay only tend to improve the panel might, and often did, develop awkward little shapes and ungainly angles when the colour was applied.

Having settled on the scale of the work and on the colour scheme, one proceeded with the modelling. The relief one used would depend on the lighting of the position in which the work was to be placed and its height up. It did not need to be very high relief to get the best colour effect. Very high relief, like work in the round, had often been coloured, but the result was much inferior to that obtained by a more reticent treatment. A very slight relief would make the work tell much more distinctly at a considerable distance than the boldest painting on the flat. For work that was high up very simple planes and well-defined edges were all that were needed and all that would tell; subtlety of modelling on the surfaces would be quite wasted, though when near the eye one could not have the work too elaborate and careful. The great thing was to get the drawing good and the masses of colour well distributed. The modelling was the part which took the longest to do, and it was a most attractive and interesting part of the work. When the clay model was finished it was cast in plaster. Plaster would last for centuries if out of the reach of damp and rough usage. The best material he had come across for the purpose of stopping the suction of the surface was white shellac. After the ground was thoroughly stopped one proceeded to gild such parts as might be desired, whether to be left as gold or to be used as a ground for colour. A few days were allowed for it to set, and then one went ahead with the colour—ordinary artist's oil-colours with wax (white or paraffin wax dissolved in turps as a medium to stop the shine of the paint). One could use tempera, but in that case the surface must not be washed or sprayed for a considerable time. Anything approaching realism or illusion in the colouring was impossible, besides being undesirable, for the decoration demanded a man with the faculty of designing colour. In the application of the colour the best results were obtained by doing it in various stages—putting a coat on, and wiping it off here and there from the more prominent parts, and, when dry, putting another colour over it and wiping it away so as to show the first coat; sometimes using transparent colours, sometimes opaque, letting a colour lie in the devices of drapery and applying another to the raised parts to get a broken effect. There was no end to the variety to be obtained, and experience only could teach how much could be done. The treatment lent itself to any amount of elaboration. Personally, he disliked the effect of one plain surface of paint, but one most particularly wanted a sense of colour. Pattern could be added and anything else to make the work more sumptuous and splendid; but the essential thing was to keep the colour in mind when doing the modelling. They should arrange the folds of drapery to hold shadows when they wanted to enrich the effect, and have little raised folds when light lines were wanted to tell by wiping the colour off them. All sorts of ways would be found for varying the surface in order to give the colour as much variety of quality as possible. They would find they would have to use stronger colour than they expected. One colour which was extremely useful and beautiful was black. Blue was never very pure-looking; red tells very well, but the best results were got by combining strong colour with gold.

The lecturer, having shown some interesting lantern-slides, spoke of the way to use mosaic and explained its limitations.

A mosaic decoration is composed of definite separate pieces of glass not varying greatly in size. Much of the old mosaic consists of pieces of from $\frac{1}{4}$-in. to $\frac{3}{8}$-in. square pieces; larger than the latter are not common. The interstices between these pieces are an important element in the general effect, and can be used to gain some variety of quality to the surface by making them wider or narrower as may be desired, thus allowing the colour of the cement, or putty as it is called, in which the tesseræ are set, to affect the general colour more or less. This all-over quality given by the interstices naturally makes for a certain monotony in texture, and is one of the reasons why mosaic is unsuited to anything approaching realism. It gives a certain flatness which is eminently agreeable in a decorated wall surface, and one which demands a certain austerity or stiffness in the design. The florid works of the later masters all look as if they were executed under protest as it were, and were substituted against their will for a more fluid and facile method, such as oil paint. They miss the attraction proper to mosaic, and what attractions they possess are obtained in spite of, instead of with, the help of the material used. These remarks apply to work designed by some of the greatest artists who ever lived, such as Titian, Tintoretto, and Raphael, which again asserts the law already alluded to—that the right use of the material must determine the design. The effect of flatness was assisted by the fact that the colour masses in mosaic do not look so strong as the colour of the individual pieces of glass would lead one to expect. This is partly because of the aforesaid interstices, partly because of the tesseræ not lying absolutely smoothly—though this has been achieved with lamentable results—and, being made of glass, the surface of some few of them is sure to reflect the light somewhat at whatever angle you stand to them; an additional reason is that the tesseræ, being many of them more or

less transparent themselves, hold a little shadow from the piece above or from the putty which lies between; whether the shadow is above or below or at one side depends, of course, on where the lighting comes from. The slight shine on the surface of parts naturally affects the warm colours more than the cool ones, which lose comparatively little. Red therefore bores, and also orange, which never looks pleasant if gold is also used. Greens, blues, and whites are most reliable. As to the actual work of designing and executing a mosaic, after a sketch has been made giving the general design and colour scheme, cartoons are made of the actual size of the work; these are coloured, and often the tesseræ are marked on them, or at least on parts of them, showing the directions in which the lines of tesseræ are to go—a very important consideration, and one which affects the merit of the result enormously. These cartoons may be made any way you like—oil, water-colour, pastel, or tempera. Pastel has the advantage that you can exactly repeat any colour you like; but on the whole he found water-colour best because pastel gets so badly knocked about on the scaffold if the work is done as he had had it done *in situ* and from the front. When the cartoons are made there are two methods of executing the work; the quickest and he believed still the usual one was to lay the cartoons on a flat table and to match the colour with the tesseræ, laying these face down on the cartoon on the spot of colour they match when the whole cartoon is done in this fashion, or a sufficient amount of it not to be too unwieldy. Cement is spread over the tesseræ and a slab of slate placed over the whole; when set this is taken up and turned round, and the finished mosaic is seen on the front. This is a quick and straightforward method, but its disadvantages are that you can never see the front until the work is finished and unalterable, that there is an unpleasant smoothness on the surface (though it is true there are various tricks in use to modify this), and also that, as the work is done in rectangular slabs usually of the same size, it is possible that these may show when placed *in situ*. A most disastrous effect of this is to be seen in what must have been one of the most magnificent of old mosaics in the Lateran Church at Rome, where the great apse is quite ruined.

He preferred the other way It is longer and therefore more expensive, but it is much more interesting, and you can see what you are doing all through the work, and can make any alterations which may seem advisable—alterations in colour, in size of tesseræ, in width of interstices, or in direction of lines of tesseræ; this latter often occurs.

The wall on which the work is to be placed must be dry and with sufficient roughness to form a key for the cement or putty. You soak it well with boiled oil, and after a day or two you apply the putty to as much of the surface as you expect to cover before the putty sets hard. On this you prick out from a tracing the portion of the cartoon intended for it. Then with the cartoon itself beside you and your tray of tesseræ at hand you commence matching the colour and pushing the tesseræ into the putty side by side, usually showing the cut edge, not the front of the piece as shown in the model.

Something should be said as to the cement or putty. Portland cement was often used, he believed, but there were various mixtures of a more slowly-drying nature. An early formula gives a simple admixture of slaked lime and marble dust in the proportion of one to three. Sometimes a little linseed oil was used. A formula adopted by the later workers, after the Renaissance, was powdered travestine, 60; slaked lime, 25; raw linseed oil, 10; boiled oil, 6. Care should be taken in exterior work to use a mixture which will not be affected by the heat of sunshine.

Naturally the skill of the executants varies considerably, and, as you cannot exactly reproduce in glass the colour of pastel or water-colour on paper, a great deal will depend on the taste of the individual; and for this reason, if for no other, it is best to work from the front, as then the designer can keep in constant touch with the workers and can talk things out with them whenever any difficulty occurs.

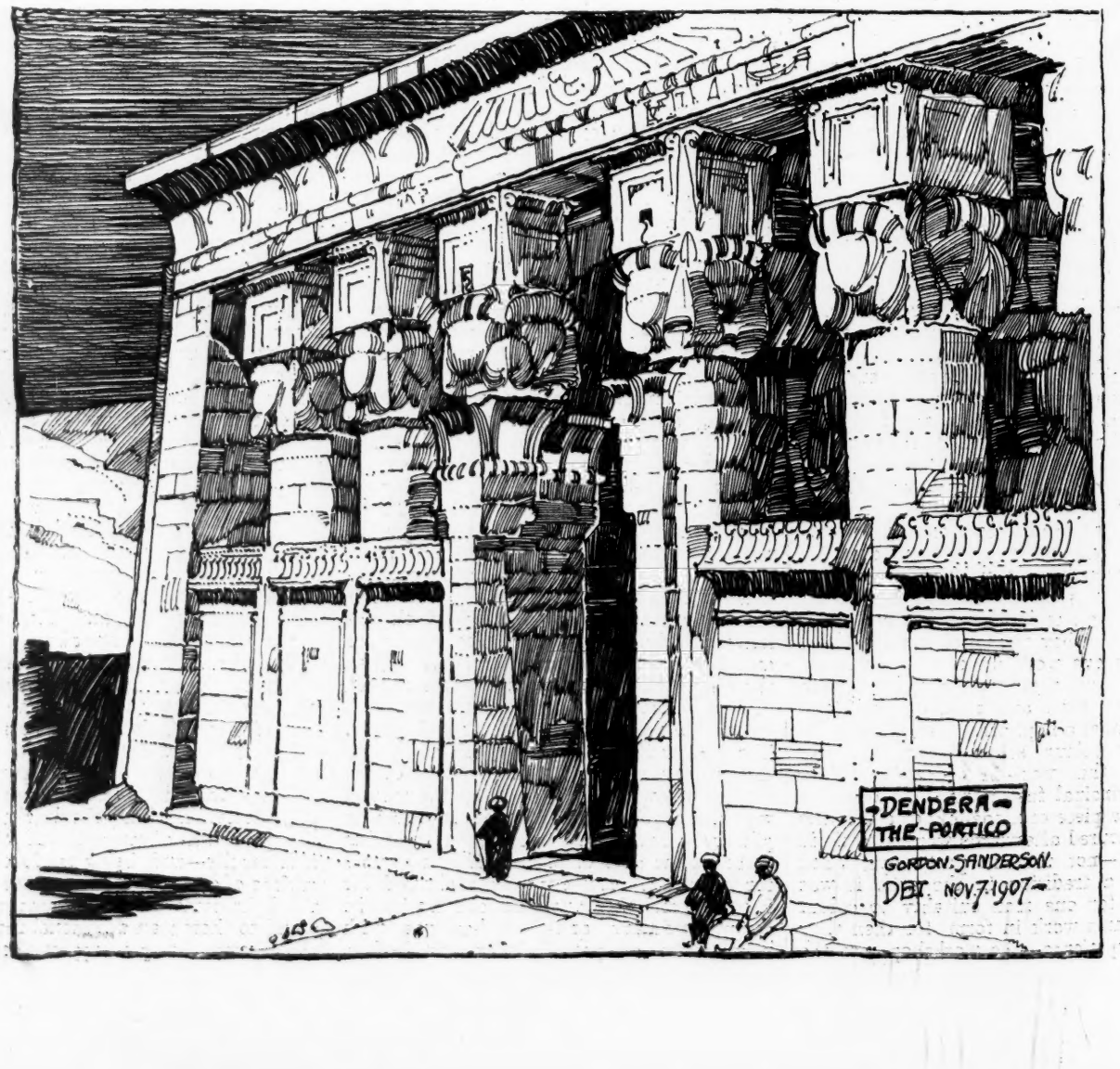
Mosaic was the most splendid and the most permanent form of wall or ceiling decoration, but its limitations must be studied and respected, or it will exact a terrible revenge. With the exception of stained glass, no decoration can be more satisfactory and delightful when properly used, and nothing more overwhelmingly disastrous when forced beyond its scope.

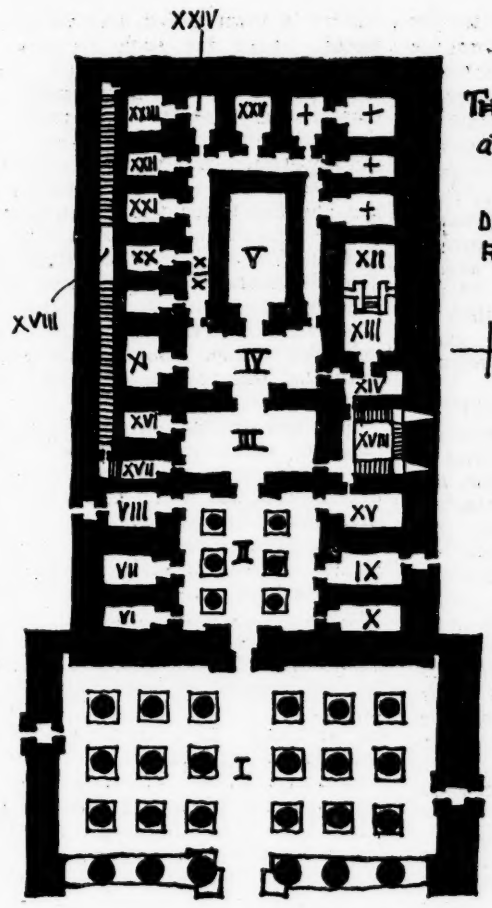
A hearty vote of thanks was accorded to the lecturer and the proceedings terminated.

A NOTE ON THE TEMPLE OF DENDERA, UPPER EGYPT.

THIS temple is dedicated to the goddess Hathor or Aphrodite. It is of late date, and by many, especially ardent Egyptologists, is looked on with little satisfaction as the figures and hieroglyphs are not good examples of their kind, being executed at a date when Egyptian sculpture and mural decoration was on its wane. It is the work of Ptolemies and Cæsars, and is undoubtedly most imposing architecturally. It is in an excellent state of preservation, and the portico which is shown on the sketch is of very fine proportions, and still retains clearly its original mural decorations. The roof is still extant, and much of the painting is still in its original state, and one of the interior walls carries the portrait of Cleopatra.

The temple was erected in the reign of the XIth Ptolemy, and was finally completed in the reign of Nero. The portico is an addition to the original scheme. A dromos





THE TEMPLE at DENDERA. (UPPER EGYPT) DEDICATED TO THE GODDESS HATHOR.

- I PORTICO
- II HALL
- III INNER HALL
- XVII CHAMBER
- XVIII STAIR TO ROOF
- XII, XIII, XIV. ROOMS
- IV. CHAMBER
- XI ROOM
- V SANCTUARY
- XIX AMBULATORY
- XXV CHAMBER OF GODDESS
- VI LABORATORY OF OILS & PERFUMES
- VII ROOM FOR OFFERINGS SUCH AS FRUITS ETC.
- VIII PASSAGE FOR OFFERINGS FROM UPPER EGYPT
- IX " " FROM LOWER EGYPT
- X TREASURE CHAMBER
- XI ROOM FOR VESTMENTS
- XII, XIII, XIV, XV, XVI, XVII CHAMBERS FOR FESTIVAL OF NEW YEAR.
- + CHAMBERS FOR WORSHIP OF OTHER DIVINITIES.

SKETCH PLAN

NOTE. II USED AS ASSEMBLY HALL FOR PROCESSIONS.
III, IV ANNEXES OF II AND CONTAINED ALTARS
V CONTRINED THE 4 SACRED BOATS

leads up to the temple, which stands, like all Egyptian temples, in the middle of a mud-brick enclosure. The massive cornice gives a fine character to the portico. In the thicknesses of the walls are passages and secret chambers, access to which could only be gained by the moving of some mechanical contrivance. GORDON SANDERSON.

TOWN PLANNING.

THE following papers on Town Planning, (1) "Architectural Considerations," by Mr. Stanley Hamp (Vice-Chairman Architectural Association Debating Society); (2) "Engineering Considerations," by Mr. Frank R. Durham (Past-Chairman Junior Institution of Engineers), were read at a joint meeting of the Junior Institution of Engineers and the Architectural Association Debating Society on February 11.

Mr. Hamp said:—

"Aristotle has wisely defined a city as a place where men live a common life for a noble end, and I cannot but feel that we must all approach this important subject in a similar spirit if we are to be successful in our efforts.

The subject has so many issues that I feel it extremely difficult to condense what there is to say within the limits of time at my disposal, and I must crave indulgence if my remarks appear somewhat disjointed. We must all realise how very desirable it is that this subject should receive the earnest consideration not only of the architectural, but of all other professions, and, in fact, of every member of the community who is interested in the well-being of his fellow-creatures. We therefore feel it to be a good omen that the members of the Junior Institution of Engineers should have selected this subject for a joint debate.

The joy of town-planning is one of increasing interest to architects, who must approach the subject almost as a new art, the principles of which will have to be relearned for ourselves from the work of other times and other lands. Hitherto, and particularly during the last century, our modern towns have been mere aggregations of people, and no thought seems to have been given to their planning. In comparison, one feels more and more how well the builders of former times were successful in uniting utility and beauty in work of this kind. The task at first glance appears so simple and yet, after the experience of later times, proves to be so very difficult—the present conditions of modern life have not been thoroughly understood, and until we consider the question from the sociologist's point of view we must inevitably fail. We have, I fear, become so used to living among surroundings in which beauty has little or no place that we do not realise the real ugliness of it all, and we forget that this state of things belongs almost exclusively to the period covered by the industrial development of recent times. We do not find evidence of it before then.

We cannot if we would reproduce the conditions under which the old towns were created, but we can try to possess the spirit and feeling which inspired the ancient builders in their work.

The lack of this feeling is only too apparent in the modern suburb. There is quite an absence of thought in the individual building or in its adaption to the site or surroundings. A stock plan seems to have been invented, and this is reproduced in row upon row without regard to level aspect or anything else. It is only too apparent that the newer portions of our English towns represent a hopeless jumble of unrelated groups of streets. Miles and miles of ground which only a few years back were open fields are now covered in this way with disastrous results. The buildings have been erected without any consideration for the common interest of the people, and yet it is only during the last few years that the real need of a Towning Bill has been recognised.

Fortunately for us the subject has been very carefully studied in Germany during the last thirty years by students of sociology and members of Municipal Authorities there, and, although it is late, we are glad to see at last signs of an awakening in this country.

Although we have only just begun to realise the importance of comprehensive and orderly planning of our towns, I do not suggest that no steps have been taken to cope with the evils raised by their rapid growth. Much good has been done in the direction of an ample supply of pure water, in the drainage and removal of waste matter, and in the paving, lighting, and cleansing of our streets, and in many other ways such as the provision of proper air spaces, light and ventilation, and general stability of construction. But still the fact remains that there are vast districts growing up around all our large towns which for dreariness and ugliness it is impossible to equal anywhere. Even compared with the slums of earlier times there is an entire lack of the picturesque which even these places always seem to possess.

I fear the fault lies in our total disregard for the amenities of life. We forget that, given the most perfect water supply and drainage scheme, etc., these dreary streets, with their squalid backyards, can never become suitable homes for mankind. We have shown a certain disregard of our duty to the common people, and have done only in a niggardly way what needed doing. We have lacked the insight of imagination and the generosity of treatment, and we show the lack of that feeling for beauty which perhaps more than anything else proves that the work of town planning in the past century has been a failure in this country.

It has been urged that no extension of a town should be taken in hand except with the guidance of a plan prepared to provide for the probable needs of the next thirty years, and this plan should mark off:—

(1) The land needed for roads, streets, and public open spaces.

(2) The land which may be built upon.

The plan should also divide the whole area into districts, to be used respectively for residential, business, and manufacturing purposes. Adequate means of cheap and rapid transit from dwelling-places to workshops and to places of recreation should also be provided, so that the cost of the dwelling shall bear a right relation to the occupant.

Safeguards must be provided against the exorbitant rise in the price of land, and against the cost of building and the consequent increase in rents of houses. All these matters must receive careful consideration if town planning is to be wholly a success. High rents lead to terrible overcrowding in most large towns. The owner's main interest too often has been to produce the maximum increase of value possible for himself, by crowding upon the land as much building as it would hold.

We need to have more open ground, air space and sunlight for each dwelling, and proper provision should be made for parks and playgrounds in our towns. We must have powers to reserve suitable areas for factories and workshops, where they will have every convenience for their work and cause the minimum of nuisance to their neighbours, and, above all, we must infuse the spirit of the artist into our work.

In the past we have too much regarded art as something added from without, as some species of expensive trimming to be added at pleasure, and much of the vulgarity we see about us springs from this mistaken idea; the beauty which is to live is not a quality which can be plastered in this way upon our buildings. The charm we feel in the old work is largely due to a greater degree of beauty in the individual buildings, many of which are quite simple and unadorned. We must remember that real beauty is possible only when the spirit of the artist permeates the work.

George Haussmann gave a new impetus to town planning when he began, in 1852-1870, the reconstruction of Paris, and the great and masterly town planning work which has since been carried out in that delightful city emanated from his brain. His work is characterised by straight lines, formal arrangements, and geometrical patterns. Many roads are made to converge at important points, and usually these points are chosen so that some monument or public building stands in full view down each of these roads. In our recent attempt here in London, shown in the construction of Kingsway, we have spoilt all possibility of such an effect by erecting hideous iron railings around the entrances to the tramway stations in the centre of the road, which, apart from their peculiar ugliness, have destroyed any chance of a fine vista which might have been possible without them.

In America, until recently, town planning has been arranged upon a rigid gridiron or chequer-board pattern, but this monotonous latticework of streets laid out in parallel lines, cutting up the building areas into rectangular blocks is now compelling the Americans to consider new systems. Diagonal streets are now being arranged, and in some cases cut through the existing blocks. This arrangement, however, leaves numerous acute angled plots, which certainly do not lend themselves to the production either of very successful groups of buildings or very useful open spaces. In America also special attention is being devoted to the provision of parks to break up the monotony of the towns and provide breathing spaces, and wide boulevards arranged to link up these features and so provide walks and drives about the towns.

In Germany the geometrical design and more regular planning is giving way to irregular systems. This is particularly noticeable in the later plan prepared by Professor Theodor Fischer for the enlargement of Stuttgart, which shows greater adaption to contours and less regular treatment. There is a great deal to be learnt from the modern work of the Germans, but there is a danger of this irregularity peculiar to their later plans being introduced for its own sake, without any appropriate reason. The Germans, however, seem to lack the necessary order of design which is always essential in the plan of a town if it is to be readily understood. The ease with which a stranger is able to grasp the leading features in a town is generally a sure sign of the success of its planning, as in the same way a building may be said to be well planned when it presents few difficulties to the person getting from one part to another.

From the foregoing it will be seen that there are two clearly marked schools of town designers:—

(1) The formal and regular plan.
(2) The informal and irregular plan.

Both types have their merits. Paris and Copenhagen would be a good illustration of the first, and Oxford and Rottenburg of the second. Both schools include men of such distinguished abilities and produce results of such marked beauty that we have not to decide between them, but rather study what is valuable in the aims and methods of each.

Camillo Sittee, by a careful study of the plans of mediæval towns, came to the conclusion that these were designed on lines which not only provided completely for the convenience of traffic, but were in accordance with artistic principles, upon which the beauty of a town must always depend. Impressed by the picturesque and beautiful results which sprang from devious lines and varying widths of streets, and from irregular "places" planned with roads entering them at odd angles, Sitte has further maintained that much of this irregularity was deliberately planned in accordance with the artistic principles then so well understood. Be this as it may, there can be little doubt that the true artistic tradition was steadily maintained and certainly led the early designers to do the right thing in each case.

We shall be wise at present to avoid dogmatising on these theories and to keep closely in touch with actual requirements, and be satisfied if we can give comely form and expression in the most simple and practical manner to the obvious needs of those who are to dwell in the towns or the suburbs we plan. While we welcome the picturesque, we would err if we should allow the love for informality to follow lines detrimental to the public convenience or to the destruction of all comprehensive planning. The formalist, on the other hand, would be open to the opposite temptation, and would be wrong if he paid no attention to the property boundaries and the sentiments of individual owners of the various plots of land comprised within his scheme.

It must be remembered that there is a limit to which a town should extend continuously without some break. Abroad, this has been appreciated, and wide boulevards, avenues, or belts of park land have been introduced. These belts might define our parishes, and would be invaluable as breathing spaces for the town.

We must also remember that it is important to secure some orderly line to which the country and town may join and avoid the irregular margin of derelict building land which so utterly spoils the approach to almost all our towns to-day. There must also be proper relation and proportion between the different parts of our design. We must emphasise some parts and subordinate others. To do this, we must have definite centres, or, as they are more accurately termed, "places." These open spaces should have definite shapes, and the architecture surrounding them definite skylines, and should be regarded as the frame to a picture. A regularity of form is by no means essential, and is often very difficult to discern. Thus, in St. Mark's-place we see how deceptive such a plan may be when put on paper, for to the ordinary observer it is seldom apparent that the lengths of the two shorter ends are not identical, whereas, as a matter of fact, the end nearest to St. Mark's is actually half as wide again as the opposite end. It is sometimes advisable to emphasise by slightly projecting the centre buildings of a side, and in that way. the skyline is often greatly enhanced. These places enable the town planner to group the various class of buildings, such as:—(1) Municipal place; (2) business place; (3) ornamental place. The first would be for municipal and public offices; the second for important business premises, market place, and railway termini, etc.; the third for ornamental gardens to contain monuments and other objects of beauty, without which no town may be said to be complete.

Now let us for a moment consider what form these places should take. The oblong is perhaps that most generally used, and an agreeable proportion between the sides is as 1 to 3. The square form is pleasing where streets enter at the four angles. The triangular form is not so often used for an architectural place. The circular form is too regular and geometrical to be very pleasing, and as a rule is used more to facilitate the circulation of traffic at points where many roads meet than for its architectural value.

This place therefore is an important feature in town design, and we must select suitable sites for such features in our planning. They should either form the focal points for the main traffic or they must be very near to these points. There should be one in front of every important railway-station, to give dignity to the main entrance to the town and afford space for the bustling traffic which must congregate there. The station itself should be recessed in this place with no roads flanking it, to give the stranger emerging time to realise the direction which he ought to take and help to minimise the danger from the busy vehicular traffic. These places should be connected one to the other by broad and important thoroughfares.

For the success of these features the sense of enclosure is essential. This can be obtained by a continuous frame of buildings in which the street openings are small in relative extent and not too obvious.

If we examine some of the most successful ancient places we shall find these breaks are usually so arranged that they hardly break the frame of buildings at all. This sense of enclosure is perhaps one of the most important principles to be remembered in designing these features; a feeling of repose, which is so delightful, can only thus be obtained. The complete isolation of buildings often, I feel, prevents them being seen at their best. Size and scale itself is only possible when a building is seen in relation to other buildings, and the real impressiveness of a building can only be appreciated when we can obtain a view of it in relation to its surrounding houses, when we are able in some degree to measure it with others, we can then, and only then, fully realise the splendour of its dimensions.

Proportion in town planning, as in architecture, is a matter it is practically impossible to reduce to figures; it must be judged of in each case according to the circumstances. There are ways of securing a sufficient background for the buildings and a sense of enclosure in a fairly large place by arranging the roads so that at the main points where people stand to view groups of public buildings direct vistas are not possible. The roads may pass out of the square at right angles to the line of vision, or if along the line then their direction may be diverted sufficiently for the vista to be closed with other groups of buildings.

One of the difficulties of the town planner is that he must lay out his streets and places often with very imperfect knowledge of what will be the character and height of the buildings surrounding them, and for this reason fairly straight lines should be followed. It is important to remember that owing to the nature of vision a group of buildings taking generally a concave line is likely to be more pleasing than one taking a convex line.

The centres of these places as a rule should be kept free of statues or monuments; these may more satisfactorily be placed at the sides or in the angles, as in the Roman Forum. They arrange themselves so much better in the picture when not too isolated. When statues are placed in the middle of busy roads they cannot be seen with comfort, and their effect is entirely lost in the traffic. To use them as obelisks for dividing traffic is to show a want of appreciation of the sculptor's aims and art. We must also not forget that more depends in town planning upon the plaeing of buildings than upon the buildings themselves, for a noble structure amongst mean and ugly surroundings is almost worthless in any scheme of town planning. Public buildings, standing as they do for the whole community, should represent its loftiest aims, its noblest sentiments, and its highest ideals. The Louvre and Tuilleries gardens in Paris, perhaps, is the most glorious example of what is possible in this way that we have in the world.

Forecourts are very valuable in town planning, and add much dignity to a building, as they enable the edifice to be seen in

more favourable perspective. In France this is fully appreciated, and few important buildings are planned without it. Perhaps the finest example we have of this arrangement is that which Bernini planned in front of St. Peter's, Rome. Sir Christopher Wren also designed a similar colonnade to surround St. Paul's, and if it had been carried out it would probably have enhanced the beauty of that very noble edifice. Many of the French XVIIIth century chateaux have delightful forecourts which might well be installed in modern town planning schemes.

It is also upon the treatment of street junctions that much of the effect of a town will depend.

Roads are primarily highways for traffic, but have a secondary purpose in affording sites for buildings. They must therefore be considered in relation to both these functions, and in the order of their relative importance. They must provide easy access from any point in the town to any other, and particular care must be taken in relation to the flow of traffic from the outskirts to the centre, and from a residential district to a quarter occupied by factories or other places of employment, or to important railway stations.

The sense of enclosure is just as important to the streets as in the place; they should be broken from time to time by an alteration in the line of the street, or by a change of direction or curve, either of which has the effect of bringing into view at the end of the street some of the buildings on the concave side.

Where streets cross at right angles, it is desirable to close the vista along one of the streets, which can be done quite satisfactorily by moving the opposite street to the right or left as the case demands. There are several other simple ways of doing this with effect. The most common form of streets is that representing a trellis; this arrangement is not good, as it does not provide convenient roads for passing to and from the centre, for, except when going in two directions, all traffic must travel along two sides of a triangle. It also produces a very monotonous effect.

The introduction of diagonal roads is certainly an improvement, but the shapes of plots and road junctions that this will cause does not create satisfactory building sites or beautiful open spaces. Except in cases where distant views are desirable, straight roads indefinitely prolonged without change of direction are dreadfully monotonous and unsuitable. The change of direction of a street must be managed in such a way as not to impede the traffic. The electric train—street railway, and motor-car require that abrupt changes of direction or sharp curves shall be avoided.

This traffic problem in large towns demands serious attention, and places will require to be made at the junction of important thoroughfares to give ample space for its circulation. M. Hénard suggests that for really busy centres the most convenient arrangement is to have a round space with the traffic circulating in one direction. Vehicles coming from any one road can fall in with the line of traffic, circulate with it, and fall out again when they reach whichever of the roads they wish to pass down.

To assist the pedestrians to cross such circulating space, he further suggests that subways should be provided from all the footpaths leading to a space in the centre, where likewise the passengers will sort themselves and depart along the subway leading to whichever of the streets they may wish to reach.

With the increased amount of motor traffic now in our streets the safety of the pedestrian will require some such special provision to be made. Hardly a day passes but we read of some death or serious accident in this Metropolis of ours by reason of the difficulty in crossing some of our main thoroughfares. It is very needful that at all street junctions there shall be such a degree of openness as will enable the traffic in one street to be early perceived by the drivers of vehicles coming along another.

German town planners argue that to bring each street singly into another produces the minimum number of collision points and is therefore the best for traffic, and they consider that the junction of more than four streets meeting at one point must necessarily be very dangerous. The French, however, on the contrary, consider that there is more safety in a number of streets meeting, provided that ample provision is made for circulation.

It has been stated that a circular roadway junction should be in width one-quarter the total widths of all the streets entering at that point. The system adopted abroad of forming multiple tracks is a good one for very busy thoroughfares. In many of these roads special tracks are provided for tramways, for riding, and for cycling.

Our English system of running trams down the centre of wide roads, with no division between the tram lines and the vehicular traffic makes it extremely dangerous for the poor pedestrian. In America the tracks are often run along a belt of grass, with footways on either side. Such roads are, however, very costly to make, and can only be employed for main thoroughfares in large towns.

Curved roads are useful in a plan, and tend to break up the monotony of the straight street, which is its chief disadvantage. The curved road, furthermore, affords to those passing along it an ever-changing picture—a new group of buildings coming into view at every point. They should, however, be used with great care. Probably straight streets combined with a few simple and regular lines will give the most successful results. Too often streets are arranged quite regardless of the contours of the ground which, when so planned, not only increases very largely the cost of construction by the levelling necessitated, but destroys any interesting character that would and does arise from a more perfect adaptation to the peculiar conditions of the site.

In conclusion, it is important to remember and arrange for the natural decoration of the streets and places in towns, and, wherever the conditions of the atmosphere are suitable, to plant trees and grass—the free use of greenery in this way is one of the pleasing characteristics of Continental cities. This form of decoration, however, needs considerable judgment and restraint. Breadth and simplicity of treatment are essential to good results. The avenue effect, as the French have instinctively felt, is one of the finest methods of decorating streets with trees. At the junction of roads spaces may be arranged where the planting of a few trees will introduce colour and the form of foliage into the picture.

I have only very briefly referred to what I feel to be a few of the important features which must receive our careful consideration and study when we are called upon to deal with this very important subject of "Town Planning," but I trust that what I have said will be sufficient to give a lead to the discussion which is to follow."

Mr. F. R. Durham's paper, "Engineering Considerations," was as follows:—

"It is not possible in the short time at the author's disposal to treat this vast subject in any but a cursory manner. It has already been treated from the architect's point of view, and it only rests to define more or less exactly where the duties of the engineer lie.

If ever there was a science that demanded the co-operation of the architect with the engineer, or the engineer with the architect, this science of town planning is the one. The duties of the architect lie above ground; he supplies the accommodation for the inhabitants, whereas the duties of the engineer lie chiefly on or below ground; he supplies the necessary comforts without which the welfare of the inhabitants would certainly be jeopardised in spite of the architect's best endeavours to the contrary.

As we are nowadays in the habit of being told or of believing that most good things come from Germany, so also it is true that the movement in this country for improved town planning has originated from that source. In saying this, the remarkable work which has been carried out in London and the other great cities must not be forgotten. Further, it is well to remember that it was an English engineer, Mr. W. Lindley, who was largely responsible for its development abroad. The author refers to the rebuilding of the City of Hamburg after the great fire in the forties, and again to Mr. Lindley's influence in the design of the municipal works in many large Continental cities in Germany, Austria, etc.

The various principles underlying the science of town planning may be classified under the following heads:—General. Provision for Future Extension. Streets. Open Spaces, Squares, etc. Planning and Class of Buildings. Town Plans. Regulation of Cost.

General.—In planning and laying out a town, the æsthetic, hygienic, social and economic principles must be considered individually and in combination. The æsthetic principles, including the treatment of open spaces, the attainment of vista effects, the preservation of monuments, and the maintenance of features of local or national interest concern the architect. This at once necessitates the collaboration of architects, engineers, and surveyors to prevent ill-considered schemes.

Provision for the Future.—The planning and laying out of an entirely new town or village will be of very exceptional occurrence, and only likely to take place in undeveloped countries, or where a housing problem arises in the neighbourhood of intense industrial activity or mining developments. It will usually be a case of planning a new suburb or of designing new streets in existing towns to provide for further accommodation of traffic, etc., or to open up closely built on and insanitary districts in the older or poorer parts of the town. The mere fact that alterations on a large scale have to be carried out in the heart of existing towns at once brings to the fore the necessity of immediate provision for the future in new designs. There will be the consideration of providing for all probable forms of traffic, such as pedestrians, cycles, ordinary wheel traffic, trams, motors, railways, waterways, etc.

Certain streets or districts may with advantage be especially set apart for business or shop premises, factories, and residential or villa quarters. Suitable plots should be reserved for the erection of public buildings, and certain areas maintained as open spaces. All this should be considered not only for the immediate requirements, but also for the prospective development.

Planning extending over comparatively small areas should thus be distinctly deprecated on account of the difficulties which will certainly arise when future requirements of traffic have to be provided for.

This will mean that, in laying out the main arteries, great care must be taken to see that through or inter-comunication between the existing town and the future developments is not neglected. It will not suffice to design a new suburb with a network of comparatively narrow and winding roads which may for the moment appear picturesque, but will prove a serious hindrance in the future.

The determining factor in designing these main arteries will be the sewerage system. Unfortunately in this country there are few towns which can boast of a systematic network of sewers; instead most of the average systems are mere patchwork. German cities, on the other hand, nearly all have a uniform system of sewers. It was

the design of such systems which, to a great extent, led to the town planning as it now exists in their newer districts. For instance, take the City of Frankfort. Mr. Lindley, in designing the sewer network in 1866-67, determined the main lines of the intercepting sewers, and in so doing laid down the alignment of the main roads for future developments. The fine streets and avenues of the present day are the result of this early work, which has practically defined the lines of the city for all times. It may be thus appreciated that town planning in Germany has been rendered a considerably easier task than in this country.

It may be stated at once that the first care of all town planning schemes should be the provision of proper drainage, efficient not only for the immediate requirements, but so designed that all future extensions are provided for in such a manner that the contemplated development should not prove an obstruction to the later requirements, or that the future extensions should not be detrimental to those under consideration.

This leads to the next problem—the survey of the ground. The necessity of an accurate survey of the existing town and of the land to be developed is obvious. This survey should contain all levels of existing roads and the exact contours of the whole surface under consideration, as well as of the bordering districts which may be required to be incorporated at some later date.

On this map, all existing buildings, features of local and national interest, existing drainage, watercourses, boundaries, etc., should be clearly defined, and, where necessary, the levels stated. The map should either be of so wide an extent that the existing main thoroughfares of the country and the town can be thoroughly appreciated and the means of through and inter-communication studied, or should be accompanied by a plan on a smaller scale showing the above requirements.

It may be well to point out that Nature knows no political or parish boundaries, and a good scheme should not be allowed to be thwarted because of an artificial line which has been created for convenience by man and not by Nature. For instance, cases exist where the sewage of a district flows down a hill to be pumped again up that self-same hill because a boundary crosses the natural valley line. Such absurdities may entirely spoil proper development, being opposed to the hygienic, social, and economic principles of town planning. Therefore, should a town planning scheme have to be developed near such a boundary, it is well to keep up friendly relations and look for co-operation with the neighbouring district.

The usefulness of the subdivision of areas into different building zones for different purposes is to be recommended, in order that the important questions of social economy can be fully coped with, and that the individual requirements of each district can be more easily accommodated. For instance, in setting out a factory zone it may be well to study the prevailing winds of the district to avoid smoke nuisance, etc., and further, to study the transport facilities, road, rail, and water for raw materials and manufactured products.

Streets.—The various by-laws throughout the country have laid down certain regulations as regards the width of streets in accordance with the rules of light, air, height of building, etc. It may be of interest to record the street widths recommended as standard minimum dimensions by the Incorporated Society of German Architects and Engineers:—

For streets of secondary traffic requirements, 26 ft.; for streets with tram lines, 56 ft.; for streets with a centre avenue of trees (the space between the trees and the building being at least 26 ft.), 82 ft.

For main arteries a considerable width is to be preferred, and under certain conditions may be provided for by means of front gardens, public or private, which can be reduced or dispensed with when the future widening is required. This would seem of importance in the present system of garden cities or suburbs.

In determining the width in conjunction with the above regulations, the traffic requirements will have to be considered first, and, secondly, the safety and efficiency of the various engineering features on and below ground—sewers, water pipes, gas mains, street lighting, telegraph and telephone cable conduits, electric light, and power cables, tram lines, etc.

The traffic requirements have undergone so remarkable a change in recent years, through the introduction of mechanically propelled vehicles travelling at comparatively high speeds, that it is at present difficult to realise fully these needs, for instance, as regards gradient, radius of street corners, road materials, etc.

The engineering features in ordinary practice will occupy the following positions:—The sewer will be constructed on the axis of the road, the water pipe will be on one side and the gas main on the other, 3 ft. from the curb of the foot pavement; the telegraph and telephone conduits between either of these pipes and the sewer trench, and the electric cables under each foot pavement close to the building line to avoid street crossings with the house connexions. In very wide streets a duplication of mains may be required to reduce the length of all house connexions, thus insuring a greater efficiency of the various systems as well as reducing the cost of all house connexions.

The street network, as the author has already stated, should be treated in distinct reference to the main arteries of through and inter-communication and secondary streets. The direction of main arteries should be carefully considered, whether they are to be in the form of radial, circumscribing, or diagonal roads. Circumscribing or "ring" roads will be of great importance and assistance in the development of suburbs and insure proper inter-communication one with the other.

Only such secondary streets need be designed as the local conditions absolutely require. Side streets need only to be laid out for the requirements of the immediate future or left to private enterprise to be developed under supervision and sanction of the controlling authorities.

The use of existing roads, rights of way, the following of actual boundaries, railways, and watercourses, etc., the preservation of existing monuments and buildings, and of features of local and national interest, are to be recommended, in so far as they do not cause impediments to traffic or are opposed to important economic principles.

The termination or interruption of long roads of equivalent importance, the conformation of streets to the contours of the surface, the avoidance of cuttings and of hollow longitudinal sections must be considered.

Out of these considerations the following questions will arise: Gradient, straight or curved streets, the junction angle of two or more streets at right angles or at acute angles, a straight crossing or one with an off-set, to what extent street corners should be rounded off, etc.

It must be remembered that the traffic has the first claim and the general aspect the second. The ruling gradients will be partly determined by the conformation of the ground, and partly by the road covering materials which it is proposed to use. Hollow streets—that is to say, streets with central dips—should be avoided; firstly, on account of increasing the difficulties of good drainage, and, secondly, on account of the annoyance to traffic by the perpetual changing of gradients. All street gradients should be distributed as uniformly as possible, and sharp changes of slope avoided. Street and road crossings or junctions will require particular attention when they occur on sloping ground requiring the levelling or grading of various slopes.

Along railways and waterways, etc., it would appear advisable to have roads running on either side and the houses to face these features. An extra width in accordance with the local requirements should be provided for between the footings of a railway embankment or the banks of a waterway and foot pavement. In the case of railways, it will in a great degree help to mitigate the unsightliness of the embankment, especially if the latter be treated horticulturally; the whole appearance will be improved for the inhabitants of the adjacent houses as well as for the travellers in the train; land for eventual railway widenings will be provided for, and far better inter-communication for the traffic requiring to pass from one side to the other will be established.

In the case of traffic carrying waterways, the traffic will be more easily handled, as the transport vehicles can be brought alongside the waterway, the unloading and loading being accomplished by means of travelling cranes or overhead conveyors. In the case of rivers and brooks, it will turn them into a landscape feature and preserve them to a great extent from pollution by rubbish shooting.

In the case of tram traffic, the position of the rails, whether they should be laid in the centre or at the side of the road, or whether, in the case of wide avenues, a track should be constructed on either side, will have to be considered.

The question of straight or curved alignment will largely depend on the object to be attained and the financial resources at the disposal of the designer. Straight streets will sometimes afford the opportunity of acquiring an open perspective to a fine view either of a monument or building, or some feature of Nature. This may be sometimes accomplished by diverging the building lines so as to increase gradually the width between them.

A curved street may be found more suitable and applicable to the contours of the surface of the ground.

Open Spaces, etc.—Open spaces should be amply provided for; this need is intensified by the great increase of traffic and the relatively high speed at which future traffic will travel, necessitating the provision of safe playgrounds for children, keeping them as much as possible from the streets.

Extensive areas, such as parks and recreation grounds, will be few, and require special treatment, but more importance should be attached to squares and gardens, etc.

According to the purpose and relative importance of such spaces, it is well to remember that the design of an open space and the position of entrance of the communicating streets should be so laid out that the main lines of traffic can be kept to the sides, or, if not, be distributed over the whole area. On no account should they be concentrated towards a central crossing.

Large open spaces may be used as sites for public buildings and monuments. It should be well thought out whether such structures will form part of a street view or whether they will work as a surprise when a corner is turned.

Small open spaces in large numbers are preferable to large ones, and are more easily obtained by simple street widenings at cross roads or on the length of the street itself by setting back the building line on either side for a short distance.

The surfaces of open spaces may be graded, sloped, or have a central area sunk below the street level.

Plantations in the immediate neighbourhood of important architectural features should be, as a rule, laid out regularly and symmetrically; if they are of an extensive character a free and picturesque treatment may be preferred.

Planning and Class of Building.—This touches the province of the architect essentially more than that of the engineer. There is one point of importance to be remembered, namely, the density of building in the horizontal and vertical direction must be determined not only from the hygienic, but also from the economic point of view; for instance, the greater the spread of the population per unit length of street, the greater the capital expenditure and cost of maintenance per head of the population of all the hygienic requirements and traffic conveniences which modern life demands.

The depths of plots should be adequately adjusted in accordance with the class of building; the standards previously quoted give the following recommendations:—

	Ft.	Ft.
For small buildings	50	to 100
For medium-sized buildings ..	80	to 165
For large structures..	130	to 230
For factories, the distance, more especially between road and railway or road and waterway	195	to 330

In suburban developments, although the hygienic and æsthetic advantages of detached buildings may be preferred, the reservation of a sufficient proportion of open space within an area surrounded by continuous buildings will serve the same purpose. Open building has a great number of advantages in respect to air and light and architectural treatment, but in the case of the erection of small dwellings the greater expense and extravagance of frontage must be taken into account.

The building line may be interrupted by a number of off-sets in order to bring variety in the appearance of a street. As previously mentioned, the two lines, the building line and the street line, need not be parallel to one another.

Town Plans.—Everything should be done to prevent isolated and planless building beyond existing alignments. The Housing and Town Planning Act recently passed has provided for the realisation of improved town planning. The main provisions on planning may be summarised as follows:—The Act aims at securing in the future sanitary conditions, amenity and convenience by enabling schemes to be made for the development of building land with due regard to the future; the Local Government Board have powers to authorise the preparation of plans by local authorities, or to adopt schemes proposed by private owners; all such plans will require the sanction of the Local Government Board; provision is made for compensating any person injuriously affected by the scheme; and the local authority has power to recover a proportion of the amount of increased value from any person whose land is increased in value by the realisation of the scheme.

Such powers are absolutely necessary to create a really satisfactory town plan. It may be found advisable to acquire a large number of plots and to effect a redistribution in order to mitigate heavy compensation incurred by the unavoidable cutting up of a number of comparatively small plots.

How far such plans should be published and made public property is a question requiring most careful consideration to prevent undue land speculation, etc.

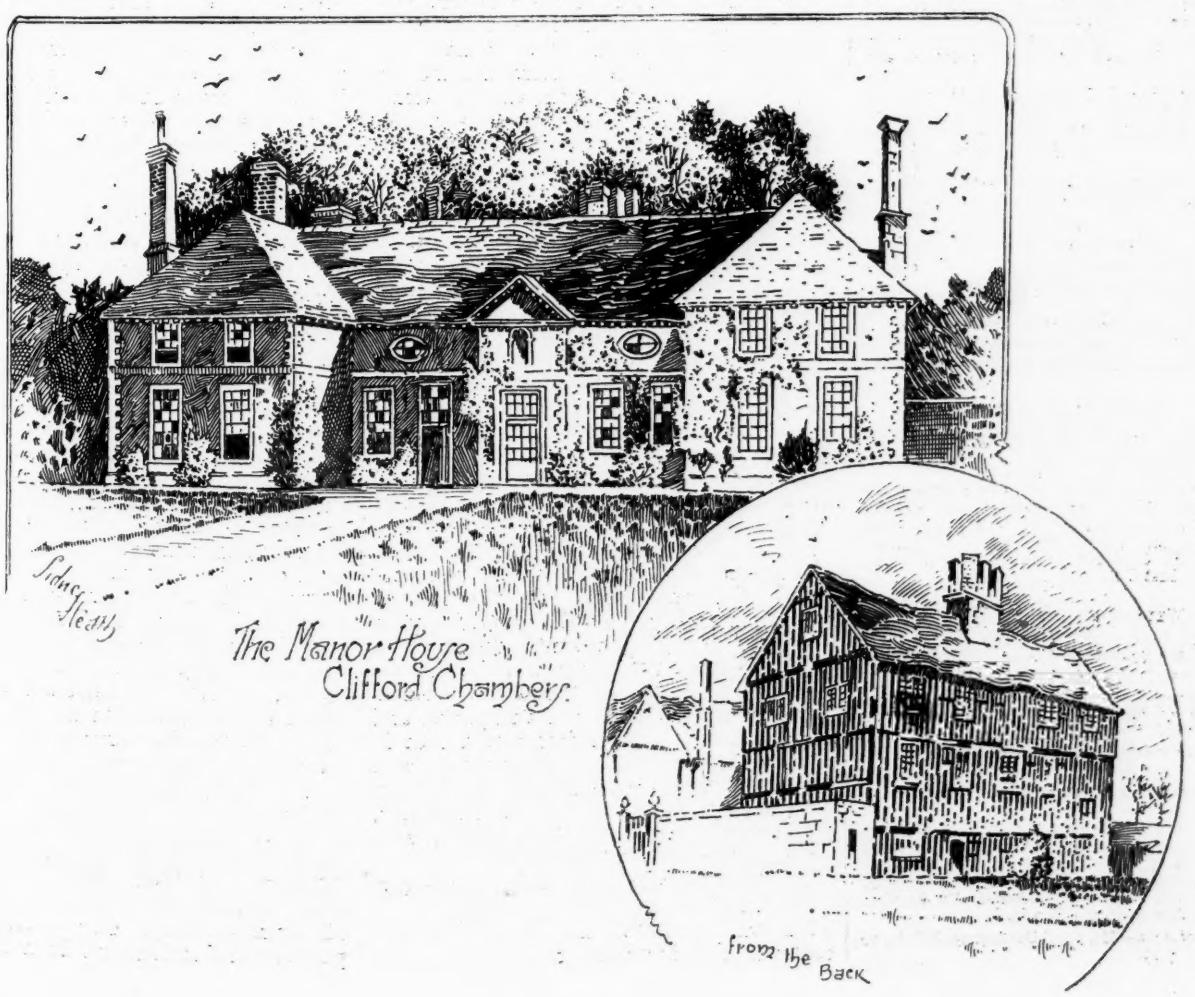
Regulation of Cost.—This question is a complex one; it almost touches on politics, and therefore for practical purposes should be left out of the discussion on the engineering requirements of town planning. If the author may say a few words on this subject, he would add that, in his opinion, the whole of road-making and sewering of the contemplated development should be carried out not by the private proprietors of the land, but by the responsible public authority. This should guarantee greater uniformity in construction and be more economical in practice. In the case of a large district, a fixed schedule of charges might be drawn up and recommended for adoption by the contracting parties. It may be questioned whether it is right to make the assessments on the actual value of the ground or on the enhanced value after the construction of the street, and whether the contributions towards construction should be calculated on the frontage or on the building in consideration of its frontage, number of stories, cubic contents, number and size of dwellings.

Conclusion.—In conclusion, the author regrets that it has only been possible to indicate some of the general principles of the science of town planning. It might have been of greater interest to have taken definite instances of modern town planning and discussed them. This seemed impractical on account of the difficulty of giving a full descriptive history and a concise summary of the local conditions in each case, without the knowledge of which the various reasons for adopting the one or the other plan would tend to be obscured. He trusts, however, that he has made it clear how necessary is the collaboration of the kindred professions of architecture and engineering, and what great duties fall to the lot of the engineer to provide adequately for the requirements of modern hygiene, so that the architect may make the best use of them in providing for the comforts of the population in the houses and buildings which he will construct for them."

THE MANOR HOUSE, CLIFFORD CHAMBERS.

THIS was the old home of the Rainsfords, a staunch Royalist family, whose estates were sequestered after the Civil War. The building is grouped round three sides of a quadrangle. The front portion of the house, shut in from the road by a low wall, is no earlier than the time of Queen Anne, but a good deal of the rear parts of the house are very much earlier, and when stripped of their plaster covering some twelve years ago, much massive timber work was revealed, and a number of blocked-up windows, opened at the same time, still bear traces of the red paint with which they were formerly covered. It is thought quite possible that Shakespeare was often at Clifford Chambers (after he had settled down at New Place, Stratford-on-Avon), for the purpose of visiting his old schoolmaster, who was Rector there. The name Clifford Chambers is due to the manor having once belonged to the Abbey of Tewkesbury, and here was a house for the monks, one of whose duties it was to provide rooms for the Abbot on his visitations, hence the name Clifford Chambers.

SIDNEY HEATH.



APRIL 2, 1910.

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"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 19s. per annum, with delivery *by Friday Morning's Post* in London and its suburbs.

To Canada, post-free, 21s. 8d. per annum; and to all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

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MEETINGS.

FRIDAY, APRIL 1.

Leicester and Leicestershire Society of Architects (Students' Evening).—"A Sketching Tour in Normandy," by r. B. J. Fletcher; "A Sketching Tour in Brittany," by Mr. S. J. Wearing; "Osmaston Hall, Derby," by Mr. Douglas W. Day. Illustrated by slides, sketches, and measured drawings.

London County Council Central School of Arts and Crafts (Lectures on Historic Arts and Crafts).—Mr. G. H. Palmer on "The Influence of Illustrated Manuscripts on the Type and Decoration of Early Printed Books." 6 p.m.

Glasgow Technical College Architectural Craftsmen's Society.—Business meeting. 8 p.m.

MONDAY, APRIL 4.

Royal Institute of British Architects.—Mr. George Hubbard on "Architecture on the Eastern Side of the Adriatic." 8 p.m.

Society of Engineers (Incorporated).—Mr. P. G. Scott, A.M.Inst.C.E., on "Moulmein Waterworks." 7.30 p.m.

Liverpool Architectural Society (Incorporated).—Annual general meeting.

TUESDAY, APRIL 5.

Builders' Clerks' Benevolent Institution.—Thirty-second annual dinner. King's Hall, Holborn Restaurant. Mr. W. Downs, President, in the chair. 6 p.m.

Institution of Civil Engineers.—Papers to be read: (1) "The New Clyde Bridge of the Caledonian Railway at Glasgow," by Mr. D. A. Matheson, M.Inst.C.E.; (2) "The Queen Alexandra Bridge over the River Wear, Sunderland," by Mr. F. C. Buscarlet, A.M.Inst.C.E., and Adam Hunter, M.Inst.C.E. 8 p.m.

WEDNESDAY, APRIL 6.

Carpenters' Hall, London-wall (Lectures on Arts Connected with Building).—Mr. Thackeray Turner on "The Craft of Repairing Buildings." 7.30 p.m.

Institute of Sanitary Engineers.—Mr. A. B. Ogden on The Cleansing of Filtering Media and Materials for Constructional Work." 8 p.m.

Edinburgh Architectural Association.—Associate business meeting.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

The Royal Sanitary Institute.—A sessional meeting to be held at 90, Buckingham Palace-road, when a paper will be read on "Sanitary Aspects of Floods, and Measures to be taken to prevent Epidemics arising therefrom," by Dr. A. J. Martin, Inspecteur Général des Services d'Hygiène de la Ville de Paris. 5 p.m.

Royal Society of Arts.—Mr. Cyril Davenport, F.S.A., on "Miniatures." 8 p.m.

FRIDAY, APRIL 8.

Institution of Civil Engineers (Students' Meeting).—Mr. G. H. Hodgson and Mr. H. M. Gell on "The Reconstruction and Extension of Egremont Ferry Pier." 8 p.m.

The Royal Sanitary Institute.—Provincial sessional meeting, Plymouth, in the Western Law Courts, Guildhall. A discussion will take place on "The Removal of Town Filth," to be opened by Mr. J. Paton, Borough Engineer and Surveyor, and "The Relative Value of Disinfectants in the Control of Diseases," to be opened by Dr. O. Hall, D.P.H., M.O.H., Devonport. 7.30 p.m.

SATURDAY, APRIL 9.

The Royal Sanitary Institute.—Provincial sessional meeting, Plymouth (continued).

Edinburgh Architectural Association.—Visit to the new markets and slaughter-houses, Gorgie.

Illustrations.

ACCEPTED DESIGN FOR WELSH NATIONAL MUSEUM, CARDIFF.

We give the perspective view and three plans of the design by Messrs. Smith & Brewer which has been placed first by the Assessors in the competition for the Welsh National Museum at Cardiff.

We commented on this and the other premiated designs at some length in our last issue. The architects state that the plan was at first tried of setting back the west front to line with the University buildings, making the distance between the museum and the City Hall nearly equal to the distance from the Law Courts, leaving a large garden for the display of exhibits. It was, however, abandoned, as it cramped the museum accommodation and reduced the length of the south front more than seemed desirable. The west front was, therefore, advanced as far as possible, and a large interior court obtained, the centre portion of which has been laid out as a garden. It is proposed to treat this interior court in a thoroughly architectural manner.

In addition to keeping the southern face of the museum in line with the adjacent buildings, the heights of plinth, cornice, and parapet have been continued and the outline of the angle pavilions repeated. Apart, however, from this, no attempt has been made to further approximate to the style of the City Hall.

The building will be of fireproof construction throughout, the roofs and floors of ferro-concrete, the skylights and windows of steel or bronze, the large doors dividing the various departments of iron, and the architraves marble. The floor or entrance-hall will be marble, other floors of teak wood blocks, and the public stairs of marble and Hopton-Wood stone; other stairs of concrete, with teak treads. Apart from the fixed and portable seats, there will be little in the building of an inflammable nature. As the museum is divided into fireproof departments any outbreak of fire can be at once isolated and dealt with by means of hydrants installed throughout the building.

The architects in their detailed report state:—"The building has been designed in a severely simple manner as being most suitable for a museum. It is, however, proposed to place groups of sculpture on the angle pavilions, as in the City Hall, and two lions on each side of the entrance, also figures in the niches under the colonnade. Figures are also suggested on the pedestals surrounding the garden in the interior court. Internally the walls would be quite plain and the ceilings of simple design. The unbuilt on ground to the south and west seemed hardly large enough to be treated as a garden for the display of antiquities, and it was thought the building would gain in dignity if not surrounded by boundary wall or railing, but the ground turfed and finished with a stone curb. On the east, however, an enclosed garden has been shown, with positions for exhibits indicated."

It is anticipated that the building will cost about 240,000*l.*, and about a third of the work will be undertaken under the first contract to be advertised for.

MERCERS' COMPANY'S HALL.

In the latter half of the XIIIth century, let us say when Walter Harvy and Henry le Frowyck, champions of the citizens, were aldermen of the *Warda Fori* (now Cheap), the Watling Street still formed the main route from London Bridge, by London Stone, to Newgate in the Wall. In the wide space of West Chepe, to the north, were St. Thomas of Acon Hospital, several parish churches, the joust or tilting green, a few houses, and the chief market. The market, a perennial fair, or bazaar, consisted mainly of rows and groups of selds, or stalls, the traders dealing by the little beam, or retail. One group was the Mercery in Chepe. The hospital (at Mercers' Hall), the middle road (Cheapside), the balcony for the lists (at Bow Church), and names of the market booths and walks remain to this day. The earlier Mercery adjoined the hospital; for an enlargement of the monastical buildings it was removed across the road to a meadow by the Crown-seld, between Soper-lane (Queen-street) and Hosier (Bow) lane. Twenty years or so after her brother Thomas of Canterbury's martyrdom Agnes and her husband, Theobald FitzWalter Le Botiler, Baron of Ormonde and Thurles, established in the house of her father, Gilbert the port-reeve, citizen and mercer, a hospital of St. Thomas of Acon as a dependency of the Order of Knights of St. Thomas of Acre. The hospital and church, served by monks of the Augustinian rule, occupied the ground now bounded by Old Jewry, (St. Olave's) Church-row, Ironmonger-lane, and Cheapside—the site of Mercers' Hall. Raised upon arches in the south-east angle was the parish church of St. Mary Colechurch, wherein the Archbishop was baptised. A grant, 1227, to the hospital cites Acon the Jew, son of Leo Blomidi, as holding the land next the house in which the Archbishop was born.

In the Mercery were sold a multiplicity of small wares, besides cloths and silks. Richard II. incorporated the community as "*Homines de Misteriæ Mercerœ Civitatis London*," in 1393. The company, ranking first in precedence, made a long sojourn in Cornhill. In 1542 they returned to their original station, having, with Thomas Gresham's aid, paid 969*l.* 17s. 6d. to Henry VIII. for the dissolved hospital and a few minor "estates," with a covenant to continue the boys' school founded, or re-founded, there in 1456 by John Neel, master of the hospital. After the Great Fire they employed Edward Jarman to rebuild their house. By reason of Jarman's death his plans were carried out by the Company's surveyor, John Oliver, who used some of the old material. He converted the spacious nave and aisles of the church into an ambulatory or void, with Roman-Doric columns, which support the hall above; an open Roman-Doric colonnade represents a side of the cloister. On the site of the choir he built the chapel, which was embellished, reseated with stalls, etc., in 1884. The two frescoes by Mr. P. H. Newman are illustrated in the *Builder* of September 26, 1885. The organ, by Father Schmidt, 1710, and rebuilt in 1868 by Robson, was formerly in the Chapel Royal, St. James's. Rowland Wynne did the panelling in the hall; much of the carving in the chapel and hall is of the Grinling Gibbons school, the grand staircase, of oak, is by J. G. Crace. The enriched elevation of the Company's houses in Cheapside, and the state entrance-gate having sculptured figures, an upper order and attic of Portland stone, are ascribed to Wren. In the rebuilding of the façade thirty years ago, by G. Barnes-Williams, Surveyor to the Company, it was found that the gate could not be embodied in the higher front. Its general features were followed; the old stones and carvings were re-erected as the front of Swanage Town Hall. The Company's offices and premises recently built at the rear are by Mr. Dendy-Watney. They possess authentic portraits of Gresham and Dean Colet; their

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coat-arms—a Virgin crowned issuing from a cloud—may be seen upon many houses in London.*

The chief feature of the hall is the screen, the interest of which, however, has been much interfered with by modern alterations. The balustrade, if it may so be termed, is of a charming and unconventional pattern, divided into compartments quite independently of the lower or panelled portion. The carving here is very fine, as in other parts of the hall. The doors could hardly have been designed in a more unsympathetic spirit. The oak of which they are constructed has not yet had time to darken in harmony with their surroundings, and we think our readers will agree with us that the whole effect of the screen has been ruined by this injudicious innovation. The mirrors were apparently inserted to give an "appearance of lightness," a phrase dear to a past generation of architects.

With regard to the stained glass windows we speak with diffidence; in themselves they are good, but we question the wisdom of their insertion. Apart from the fact of their tending to darken the room, stained glass is absolutely and entirely opposed to the spirit of the late XVIIth century Renaissance, an age intensely naturalistic in its ornament. We have taken the liberty of omitting the cut-glass chandeliers depending from cast-iron brackets, which surround the room. The bunches and festoons of fruit and flowers are fine examples of Grinling Gibbons' work. Of its style and period, the City possesses few finer examples.

BRISTOL UNIVERSITY CHEMICAL AND PHYSIOLOGICAL DEPARTMENTS.

THE ground floor level of this building (see page 383) coincides with that of the northern-most wing of the present buildings against the Botanical Garden, and the rapid fall of the land from this point towards the south admits of the provision of a well-lighted basement entered from the ground level at the lower part of the site. The corridor on the ground floor of the northern wing of the present buildings will be continued to Woodland-road, where will be the main entrance to the new laboratories. This entrance is in the base of the tower shown in the view.

The Physiological Department is on the north side of the corridor referred to, and is that portion of the building on the right hand of the tower. The Chemical Department is contained in the buildings on the left hand of the tower, and a considerable portion of it lies at the back, and is not seen in the picture. The main staircase is at the back of the tower, and serves both departments.

The Chemical Department is accommodated on the basement, ground, and first floors, and contains the following:—*Ground Floor.*—Lecture theatre, with seating accommodation for 135 students and having a preparation-room adjoining; a lecture-room seating fifty students and having its own preparation-room; laboratories for organic and physical chemistry and advanced work; professor's private laboratory; museum; and the usual balance-rooms, stores, and other accessories. *First Floor.*—Junior laboratory, having windows on three sides and an open lantern roof, and fitted for eighty or more students; bio-chemical and research laboratory; class-room; library, preparation and balance rooms. *Basement.*—Metallurgical and research laboratories; gas analysis room; also general stores and other accommodation.

The Physiological Department is contained in the basement, ground, first, and second floors, and contains:—*Basement.*—Room for photo-micrography and galvanometer work, cold store, etc. *Ground Floor.*—Lecture theatre, arranged to seat 120 students: preparation-room adjoining; museum and library; and professor's private room. *First Floor.*—Laboratory for chemical physiology, capable of accommodating fifty students; balance-room; optical-room, etc. *Second Floor.*—Histology-room, provided with north light, and accommodating fifty students; laboratory for fifty students in experimental physiology; demonstration theatre; professor's laboratory and research rooms. In connexion with each laboratory there are the usual preparation and apparatus rooms and other accessories.

The new buildings have been designed to harmonise with the old, and their character has been kept as plain and simple as possible. They will be built of Pennant stone with Bath stone dressings.

The contract has been let to Messrs. W. Cowlin & Son, who have undertaken to complete the work by the fall of this year. The architects are Messrs. Oatley & Lawrence, of Bristol.

* The school migrated to Old Jewry after the Fire; thence to Budge-row (1787); Red Lion-court, Watling-street (1804); College-hill (1808); and Barnard's Inn, Holborn (1894), where J. Chatfeild Clarke and Mr. H. Chatfeild Clarke designed the new school buildings.

Architectural Societies.

LIVERPOOL ARCHITECTURAL SOCIETY.

The annual Report of the Council for the official year 1909-1910 states that the present membership of the Society consists of fifty-one Fellows and seventy-three Associates—a total of 124. These figures compare with fifty-four Fellows and seventy-seven Associates—a total of 131, at the close of last session. There are three Hon. Fellows, nine Hon. Associates, and twenty-three students—a decrease of five students during the year. It is announced that the Council now make very careful investigation into the qualifications of all candidates for membership. The Articles of Association provide that the Society may by resolution require that candidates for associateship shall have passed such architectural examinations as the Council may approve. The Council do not recommend so rigid a procedure at the present time, but they propose to require from candidates as Associate or student, who may not have already done so, an assurance that they will forthwith prepare and present themselves for some approved architectural examination or examinations. It is observed that there have recently been few admissions to the class of Fellows, and it is suggested that Associates who may possess the necessary qualifications should make application for membership in the higher class.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A meeting of this Association was held on Wednesday last week in the Association Rooms, at 117, George-street. Mr. John Watson, F.R.I.B.A., the President, was in the chair, and a lecture was given by Mr. J. H. Stevenson, advocate, Unicorn Pursuivant, on "Heraldry as Applied to Architecture." The lecturer began by stating that heraldry was established as an institution for 400 years before it made its appearance in what might be called architecture. The earliest Scottish instance—probably not far behind the earliest of neighbouring countries—was apparently that found on the shields on the outside of the Castle of Dundonald in Ayrshire. Then they had such heraldry as that at Bothwell Castle Chapel and the keep of Craigmillar, both of which were referable to the XIVth century. After that examples began to multiply, and with the spread of decorated Gothic, and the ideas of which it was an outcome, heraldry was adopted largely, indeed profusely, in buildings both secular and sacred. That reached its height in the Renaissance style. Both in the XVIIIth and XIXth centuries the art of the herald seemed rather at a discount, but the architects of to-day were again making a study of and exhibiting an interest in the subject, and that fact might be expected to assist materially in establishing heraldry as a thing both of ornament and of historical use. The lecture was illustrated by a large number of slides, and after some discussion a vote of thanks was accorded Mr. Stevenson.

Engineering Societies.

THE INSTITUTION OF MUNICIPAL ENGINEERS.

At a meeting of the Council of the Institution on the 23rd ult. six applicants were elected to membership and two to studentship. One student was transferred to the member class. The roll of the Institution now stands at 704 members and ninety-seven students, making a total of 801. The draft of the proposed amended by-laws was considered and approved by the Council, and it was resolved that a special general meeting for its approval by the members of the Institution be held on Saturday, April 23, at the offices of the Institution at twelve o'clock. A copy of the proposed amended by-laws may be obtained on application, and the suggestions of members unable to attend will be duly submitted and considered at the meeting. At a special council meeting held on the 16th inst. the arrangements for the examinations were finally settled, and it was decided to hold the first examination in London in October next.

PICTURE EXHIBITIONS.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

THE Institute has made a feature in this exhibition of a small loan collection of works by Mr. E. J. Gregory, its late President; which, however, is hardly an adequate representation of his talents, most of them being rather small and slight works. In regard to size and subjects "The Artist's Honeymoon" is the most important; the most interesting are the two small figure-studies, evidently from the same model, entitled "The Lute-Player" and "The Reception of a Song." "An Intruder," which is practically a picture of the back-yard of a house, is a good example of Gregory's painstaking representation of realistic detail.

For the rest, the exhibition is, as usual, a collection of a number of works which are up to a certain level of accomplishment in execution, but fail in special interest or in imaginative quality; there is a great deal that is commonplace, enlivened by a few works here and there which rise above the general level. Sir J. Linton's "The Improvisatore" is a good study of a group in Renaissance costume, fine in colour (as this artist always is) and not without interest in composition and character. Among landscapes to be noted are Mr. Haité's "On the Shores of the Mediterranean"; Mr. Bruhl's "Old Gravel-Pit, Aveley"; Mr. J. R. Reid's "Boscastle" and "Pilchard Fishers"; Mr. John White's "The Doone Valley," though this artist is not quite equal to his usual excellence this year; Mr. Cuthbert Grundy's "Glimmering Shades"; Mr. Spenlove-Spenlove's "The Golden Hour," in which landscape is treated by the artist in a spirit of his own; Mr. David Green's "Thursley Common"; Mr. Aumonier's "The Downs above Shoreham" and "Tintagel Castle"; Mr. Frank Walton's "Coverack Bay" and "Ewhurst Hill"; and Mr. J. S. Hill's "Poole Harbour." Two little foreground studies by Mr. E. C. Clifford, "Bluebells" and "Wild Parsley," should not be overlooked.

Mr. Sainton has painted on a large scale one of those compositions with idealised nude figures of which he has made such a success in silver-point; we prefer his fancies in the latter medium. There are a certain number of subjects into which architecture enters, some of them but poor. Mr. W. W. Collins has a good drawing of "The Roman Aqueduct, Segovia"; there are one or two

of the late Count Seckendorf's paintings of Italian villa architecture and gardens; and Mr. Talbot Kelly exhibits a careful study of "Karnak."

SPECIMENS OF HINDU CARVING AT AHMEDABAD, INDIA.

THESE are among the finest examples of carved stonework in this city of temples and tombs, and are in the niches of the minaret bases of the Shâpur Mosque, which was erected by Sheikh Hoosein Mahummed Chistee in A.D. 1565. They are in pierced stonework. G. LANGFORD.

Legal Column.

WATER SUPPLY PROTECTION BILL.

The Water Supply Protection Bill has been read a second time in the House of Lords. This Bill, which also reached a second reading in the House of Lords in the last Parliamentary session, is aimed at accomplishing some alterations in the common law relating to water rights for which we have often contended. Its first object is to restrain water companies from sinking wells and constructing works unless expressly authorized by Parliament. The second object is to secure compensation for owners of private supplies who have sustained damage by the abstraction of water for public supplies, and the third object is to prevent districts being deprived of their natural supplies of water for the benefit of other districts. As regards the first point, it has already been held by the Courts that under certain circumstances a new source of supply may be a separate undertaking for which a company must obtain Parliamentary powers (see Attorney-General *v.* Frimley and Farnborough District Water Company, the *Builder*, April 18, 1908). That decision, however, turned upon the special provisions in the company's Act, and it is desirable that the principle of the decision should be of universal application. As regards the second point, the common law recognises at present no rights in subterranean water in undefined channels, and an amendment of the law is wholly desirable. An example of the kind of damage that may be sustained without any means of redress was furnished by the case English *v.* Metropolitan Water Board (the *Builder*, April 13, 1907). Lord Verulam, in the House, bore witness to the depletion of the private sources of supply in Hertfordshire, and owners in Kent could speak to a similar condition of affairs there. In that county since the establishment of so many pumping-stations, many of the deepest and old-established wells have run dry, and owners who have long enjoyed a supply of water on their properties possibly originally procured at considerable expense to themselves have been compelled to resort to the companies, thus, in a sense, being compelled to buy back their own water, which has been abstracted without Parliamentary authority and without any compensation being paid. The Government have expressed some sympathy with the Bill, and it has been referred to a joint Committee of both Houses of Parliament. It is only to be regretted that the present condition of public business leaves but slender prospects of such remedial and practical legislation receiving speedy attention.

LONDON AND DISTRICT BOROUGH COUNCILS.

Croydon.—The following plans have been passed by the Town Council:—Mr. S. Scott, five houses, Woodside-green; Mr. H. Cook, four houses, Kingsdown-avenue; Mr. C. A. Sedgwick, four shops, Belsham-lane; Mr. R. B. Manser, four houses, Teevan-road; Mr. W. Hine, six houses, Lower Addiscombe-road; Messrs. Hooker & Webb, five houses and shops, Brighton-road; Messrs. Chown & Sheffield, six houses, Pollards-hill North; Mr. W. Hemmings, twelve houses, Nutfield-road.

East Ham.—Plans have been passed for Messrs. Redbond & Co. for twenty-one houses in Lichfield-road.

Finchley.—The following plans have been passed:—Mr. C. F. Day, eight houses, Netherfield-road; Messrs. Boots, Ltd., alterations and additions to 47, High-street, North Finchley;

Pierced Stone Carving, Shâpur Mosque, Ahmedabad. Drawn by Mr. G. Langford.

Mr. C. W. Halls, four houses, Windermere-avenue; Mr. T. J. Allan, nine houses, Cornwall-avenue. Messrs. W. T. Batchelor & Sons have lodged plans for forty-five houses in Grove-road and Woodhouse-road, and Mr. Glass has lodged plans for six houses in Lankaster-road.

Hammersmith.—The work of extending cables in Wood-lane is to be proceeded with. The estimated cost is 1,212*l.*

Holborn.—A special committee, appointed to investigate the condition of asphalt pavements, report that they have come to the conclusion that there is no satisfactory substitute for asphalt paving in main thoroughfares or streets of secondary importance in the borough. In the lesser streets the gradual adoption of tar-macadam, or some materials less expensive than asphalt, is desirable. The Borough Surveyor submitted to the Council a list of fifty-three asphalt-paved streets which have not been repaved for upwards of seventeen years. In Bloomsbury-place and Bloomsbury-square (north side), Museum-street (north of New Oxford-street), and in Hatton-garden, the age of the pavement in each case is twenty-six years. Fifteen of these fifty-three streets are to be repaved as soon as opportunity offers. The tender of Mr. J. B. Munday has been accepted for builder's work to March 31, 1911, the approximate amount of the work being 270*l.*

Hounslow.—Plans have been approved as follows:—Mr. H. G. Alaway, three houses, Highfield-road, Isleworth; Mr. Bertie Crewe, hippodrome, Hanworth-road, Hounslow; Mr. A. C. Stephens, twenty-one houses, Stanley-road, Hounslow; Messrs. Samuel Kidd & Co., Ltd., offal store, Mill Plat, Isleworth; Mr. F. J. Fisher, workshops, stables, and offices, Chapel-road, Hounslow; Messrs. Hastings & Smith, eight houses, Bulstrode-avenue, Hounslow; Messrs. F. Boreham & Son, electric theatre, Bell-road, Hounslow.

Walthamstow.—The Engineer is to prepare plans for making-up Falner-road and Eveshamavenue. The following plans have been passed:—Mr. W. Downe, five houses, Shernhall-street; Messrs. Van den Berghs & Zwanenberg, warehouse, 1A, Higham Station-avenue; Mr. E. C. P. Monson, four houses, Clivedon-road, and three houses, Sheredan-road; Mr. E. G. Allen, six houses, Forest View-road; Mr. W. R. Bertie, two shops, Hoe-street; Mr. A. G. Barton, collar warehouse and workshop, Hale End-road. Mr. H. J. Feency has lodged plans for three houses in Exmouth-road, and Mr. H. H. Iles for five houses in Aveling Park-road.

Wandsworth.—Tenders are to be invited for paving Heathview-gardens, Putney. Penwortham-road, Streatham, is to be paved by Messrs. T. Wood & Sons, the contract price being 841*l.*; 103*l.* is to be spent by the Borough Engineer in paving a footpath across Clapham Common. The following plans have been passed:—Messrs. Meech & Goodall, motor garage, Babington-road, Streatham, rear of Strudland, 51, Mitcham-lane; Mr. J. Tozer, three houses, Clarendon-road, Putney; Mr. A. E. Balls, twenty-five houses, Fernwood-avenue, Streatham; Messrs. Boots, Ltd., alterations and additions to 115, High-street, Wandsworth; Messrs. L. Whitehead & Co., Ltd., electric theatre in Garratt-lane, Springfield-road, at the corner of Algarve-road; Mr. J. Watt, picture palace, Upper Tooting-road, Balham, at the corner of Fircroft-road; Mr. S. Boothman, twelve houses, Strathbrook-road, Streatham.

West Ham.—Mr. G. P. Banbury, Croydon, is to erect two temporary schools, the contract price being 1,122*l.* and 1,012*l.* respectively. The following plans have been passed:—Dairy Supply Company, Ltd., alterations to premises, Great Eastern-road, Stratford; Mr. S. Matthews, new offices for Inland Revenue, Deanery-road, Stratford; Messrs. Ward & Ball, cinematograph theatre, Chant-street, and Broadway, Stratford; Messrs. Gilbert & Constanduros, cinematograph theatre, 121, The Grove, Stratford; Sir J. H. Bethell, alterations and additions to 370, Green-street, Upton Park; Mr. W. Stewart, alterations to the Duke of Cambridge beerhouse, 105, Victoria Dock-road, Custom House; Mr. H. Dickman, alterations for cinematograph theatre, 11, Barking-road, Canning Town; Messrs. A. Gillespie & Son, factory, offices, etc., New Oil Refinery Process Company's premises, Bradfield-road, Silvertown; Mr. A. E. Symes, additions to factory of Messrs. George Rice, Ltd., Warton-road, Stratford; Mr. H. Lowe, addition to laundry, etc., 32, 34, Romford-road, Stratford.

Willesden.—Application is to be made to the Local Government Board for sanction to borrow 2,723*l.* for a proposed open-air swimming-bath in the new Harlesden recreation ground. The plans have been prepared by the Council's Engineer.

Woolwich.—The following plans have been passed:—Mr. E. H. Wright, architect, Woolwich, two-story workshop at rear of 40A, Princes-road, Plumstead; Mr. J. J. Bassett, 121, Earlshall-road, Eltham, six houses, Dumbreck-road, Eltham.

PROJECTED NEW BUILDINGS IN THE PROVINCES.

ALLOA.—Conveniences, Alloa Park; Surveyor, Alloa Town Council.

Ballater.—Hospital (1,100*l.*); Mr. Ironside, architect, Aberdeen.

Ballyconnell.—Branch, Ulster Bank; Messrs. Blackwood & Jury, architects, 41, Donegal-place, Belfast.

Ballymasanett.—Spinning mills; Mr. S. Stephenson, architect, Royal-avenue, Belfast.

Bath.—Manual training and domestic centre (5,000*l.*); Secretary, Education Committee, Bath.

Bedford.—Bacon factory (15,000*l.*); local co-operative syndicate.

Belfast. — Additions, Union Workhouse (9,000*l.*); Mr. W. Dowding, builder, Cromwell-road, Belfast. Buildings, Sans Souci Estate Company; Messrs. Blackwood & Jury, architects, 41, Donegal-place, Belfast. Warehouse, Boyne bridge, also factory, St. Murray's-terrace; Mr. J. Hanna, architect, Ocean-buildings, Belfast. Warehouse, Bedford-street; Messrs. Graeme Watt & Tulloch, architects, Victoria-road, Belfast. Warehouse, Howard-street; also warehouse for Messrs. Thompson; Mr. H. Seaver, Scottish Temperance-building, Belfast.

Blaemogwy and other places.—Five schools; Mr. W. J. Nash, architect, Angel-street, Neath.

Bournemouth.—Additions, sanitary hospital; Mr. F. Lacey, Borough Engineer. Conveniences, Westover Gardens; Mr. F. Lacey, Borough Engineer.

Broadstairs—Home of Rest, Store-road (1,030*l.*); Mr. J. White, builder, Ramsgate.

Broomsgrove.—Fire-station, etc.; Mr. A. Smith, Surveyor, Urban District Council.

Builth.—School; Mr. C. W. Best, County Offices, Brecon.

Burnham (Somerset).—Pavilion; Mr. W. H. Chowing, engineer, Burnham.

Chapel-le-Ferne (Kent).—School, Willows Fields; Rev. A. R. Jackman.

Chelmsford.—Dwellings; Borough Surveyor, London-road, Chelmsford.

Chesterfield. — Alterations, Corporation Theatre (1,000*l.*); Messrs. F. Matcham & Co., architects, Warwick-court, W.C.

Chopwell.—Forty-six houses; Consett Iron Company, Consett.

Clitheroe.—Fire-station and school; Mr. A. R. Bleazand, Engineer, Urban District Council.

Darlows Green. — Conveniences; Messrs. E. P. & B. H. Davey, builders, Southend-on-Sea.

Darwen.—School (7,000*l.*); Mr. R. W. Smith Saville, Borough Engineer, Darwen.

Derby.—Extensions, buildings, for the Secretary, Derby Friendly Trade Society.

Douglas (Isle-of-Man).—Dwellings (4,000*l.*); Mr. F. Cottle, Town Hall, Douglas.

Dronfield.—The Dronfield Urban District Council have passed plans for two new houses for Mr. Grayson, and two for Mr. Jackson in Calley White-lane.

Dundee.—School Board offices; Mr. J. Langland, architect, Dundee.

East Howe.—School; Mr. J. Fletcher, Shire Hall, Dorchester.

Easingwold.—Grammar school; Mr. J. Stuart, County Architect, Wakefield.

Erdington.—Factory (4,000*l.*); Mr. W. B. Archer, builder, Albert-road, Handsworth.

Exmouth.—Additions, cottage hospital; Mr. E. Ellis, architect, Exmouth; Mr. Hayman, builder, Exmouth.

Glasgow.—Presbyterian church, Nicholson-street (3,000*l.*); Messrs. Miller & Black, architects, 58, Renfield-street, Glasgow.

Govan.—Shops for Glasgow Engineering Company (3,000*l.*); plans by firm's own staff.

Hanley.—Theatre; Messrs. Hickton & Farmer, Bridge-street, Walsall.

Hatherton.—Farm buildings (1,300*l.*); Mr. A. Davies, builder, Hednesford.

Hereford.—Twenty-three houses, Hereford Co-operative Housing Society, Ltd.

Herrington.—Rink (2,000*l.*); local syndicate.

Holmforth. — Additions, parish church (1,200*l.*); the Vicar, Holmforth.

Holywell.—Chancel, Holy Trinity Church, Greenfield; Rev. J. W. Thomas, the Vicarage, Holywell.

Kilmarnock.—Church (3,000*l.*); Mr. H. E. Clifford, architect, 225, St. Vincent-street, Glasgow.

Leamington. — Additions, pump-room; Messrs. T. Bailey & Co., builders, Leamington. Police-station; Borough Engineer, Town Hall.

Leekhampstead.—Club premises; Mr. H. M. Morriston, architect, Leekhampstead.

Lisnakea.—Twelve houses; Mr. J. Bloomfield, builder.

Liverpool.—School, Rawson-road (7,000*l.*); Messrs. W. Hall & Son, builders, Liverpool.

Londonderry. — Stores and warehouses; Messrs. J. & J. Cook, Londonderry.

Manchester. — Centre receiving ward, Grosvenor-street, Governors, Royal Infirmary.

Maxwelltown.—Church hall (1,500*l.*); Mr. W. A. McKenzie, architect, Maxwelltown.

Mold Green. — Wesleyan Sunday-school; Trustees.

Montrose.—Warehouse, Chapel-walk, for Messrs. J. & G. Paton, Ltd., Montrose.

Moorthorpe.—Police-station; County Surveyor, Wakefield.

Newbiggin.—Baths; Newbiggin Colliery Company.

New Brighton.—Winter gardens (3,000*l.*); Messrs. Johnson & Son, builders, Liverpool; Mr. J. B. Preston, architect, North Johnstreet, Liverpool. Emmanuel Church; Messrs. Deacon & Horsburgh, architect, Liverpool.

Ospatria.—Rink, Outrang; local syndicate.

Oundle.—Additions to hospital; Surveyor, Urban District Council.

Pudsey.—Town Hall buildings; Messrs. Jowett H. Kendall & Son, architects, Pudsey.

Rawtenstall.—Additions, St. James's Church; Rev. J. W. Thompson.

Romsey.—The Romsey Town Council have approved plans by Mr. H. J. Weston for the erection of ten houses in Botley-road; and plans by Mr. A. T. Skevington for the erection of a dairy at the rear of premises in Bell-street.

Roshes, N.B.—Fire-station; Surveyor, Town Council.

Rowsley. — Primitive Methodist church; Trustees.

Runcorn.—The Runcorn Rural Council have passed plans of six new houses at Walton Inferior for Mr. George Wallington; two cottages at Helsby for Mr. John Thompson; a house and coach-house at Main-road, Halton, for Mrs. Dunbebin; and a dwelling-house at Helsby for Mr. Guy.

Sale.—Baths; Surveyor, Urban District Council.

Seahouse.—Twenty-six houses, North-street; Mr. A. Reavell, architect, Alnwick.

Sheepridge.—Wesleyan school; Trustees.

Skipsea.—Church; Mr. S. Dyer, architect, Bridlington.

Smethwick. — Electric theatre; Messrs. Kennedy, King's Hall, Birmingham.

Southampton.—The Town Council has passed plans, for Mr. G. R. Long, for additions. "Glen Eyre," Bellemoor-road, and eight houses, Beech-road.

Southend-on-Sea.—Seventen houses, Hainault-avenue; Mr. F. Padley, builder, Southend. Twenty shops, Western-esplanade; Mr. F Ramsey, builder, Southend.

Stoke.—Theatre; Messrs. Hickton & Farmer, Bridge-street, Walsall.

Swinton.—School, Holy-road; Mr. H. Lord, architect, 42, Deansgate, Manchester.

Upper Renfrewshire.—At a recent meeting of the Buildings Committee for the Upper District of Renfrewshire plans were lodged in connexion with the proposed erection of the following buildings:—Villa at Boylestone, Barrhead, for Mr. R. C. Pollock, Union Bank, Barrhead; terrace of ten cottages in Third-avenue, King's-park, Cathcart, for Messrs. John Dickie & Son, King's Park-road, Mount Florida; villa in new street off Auchenlodment-road, Johnstone, for Mr. James Barnett, Lilybank House, Johnstone; alterations on clubhouse for Cathcart Lawn Tennis Club; alterations on property in Polnoon-street, Eaglesham, for Mr. John M'Nair, 59, Bath-street, Glasgow; villa in Methven-road, Whitecraigs, for Mr. Charles J. Menart, 241, West George-street, Glasgow.

Walberswick.—Church; Mr. A. F. Scott, architect, Castle Meadow, Norwich.

Whiston (Staffs).—Church, St. Mildred's; Rev. J. H. J. Daggar, Whiston.

Worsley. — Twenty houses; Secretary, Walkden Co-operative Society, Ltd.

CHURCH EXTENSION SCHEME FOR DURHAM DIOCESE.—The report has just been issued of the Commissioners appointed by the Bishop of Durham to inquire into, among other things, the sufficiency, convenience, and adequacy of the churches, mission-rooms, etc. The Commissioners recommend the purchase of thirty sites, the rebuilding or enlarging of eight existing parish churches, the erection of fourteen churches for new parishes, of sixteen mission churches, and of nine mission-rooms. A rough estimate has been made of the cost of acquiring sites and of building the churches and mission-rooms. This amounts to the sum of 124,000*l.*, of which 44,000*l.* would be required for urgent needs, 50,000*l.* for needs rather less urgent, and 30,000*l.* for those more remote.

Master Builders' Associations, etc.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.

The annual dinner of the Sheffield Master Builders' Association was held on the 22nd ult. at the Builders' Exchange, Mr. W. Longden (President) occupying the chair.

Mr. A. W. Sinclair, of Scarborough, who proposed "The City and Trade of Sheffield," said there was no better work to which a municipality could set its hand than that of attending to the housing of the working classes. That great work would be best accomplished by the framing of by-laws which were suitable in themselves, and efficient for their purpose when carried out, and which, when framed, would be efficiently carried out. The members of the Federation were not prepared to stand by anything that was not right and proper. They did not expect to build a cottage like a palace, but they expected that a cottage, when it was built, should be well adapted for its purpose.

Councillor Neal, in reply, advocated the standardisation of builders' work to such an extent that between the tenders of half a dozen respectable people there would not be those vast discrepancies in price which were a mystery to the humble individuals who sought to do a little building. The reason must be that the builders could not all intend to do just the same quality of work and observe the same standard of wages—because he could not conceive that the difference was a difference in profit. As Chairman of the Building By-laws Sub-Committee of the City Council, he expressed the hope that when new by-laws were made, the builders would realise that they were made to be observed. He hoped that those who were ultimately responsible for the framing of them would make them such that the builders would desire to observe them and not to break them. It was a disastrous policy for any community to frame regulations which in themselves were incitements to breaches. When framed, they should be that which the corporate wisdom of all the professions and industries concerned regarded as the proper regulations to secure certain objects—first, that there should be no scamping. A good man always hoped to do his best work, but the difficulty of the builder was that he was so hampered with questions of cost that he was not able to do his best. Besides being designed to prevent bad work, the by-laws should also be so framed as to cause no waste of cost. Faddism should not govern. The cost should not be put up without increasing either the stability, the utility, or the æsthetic side of the work.

Mr. C. F. Wike (City Engineer) and Mr. J. R. Wigful replied to the toast of "The Architects and Surveyors," which Mr. A. J. Forsdike had proposed. Mr. Wike pointed out a difficulty in connexion with the by-laws. He said the Corporation, the architects, and builders were all willing to come to some sensible arrangement between themselves, but they had somebody else to deal with—the Local Government Board. Some of the regulations which the builders objected to were also objected to, in a way, by the Corporation, but they were forced upon them. He was rather afraid that when they sent to London a set of by-laws which they were all agreed would be suitable to Sheffield, the Local Government Board would say they knew better.

It was Councillor S. Smethurst, of Oldham (President of the National Federation of Building Trades Employers), who principally dwelt on the work which has been accomplished as the result of the organisation of the master builders. He was responding to the toast of "The National and Yorkshire Federation," which had been drunk on the call of Mr. J. Dawson, of Huddersfield.

Councillor Smethurst said Yorkshire had filled a big place in the national movement. It was taking a more active line than even Lancashire, although the latter county began its work first, and had the larger membership. Properly developed and perfected, the National Federation would put them in a position to rectify every abuse and oppose every unjust demand. They had already achieved much. They came into existence for the purpose of dealing with differences with the men. The latter had their complete organisation, and the result was that they were successful in any demand which they wished to force upon the trade. But the ill-advised and sometimes unfair demands which used to be made were not made now, because the men knew that when they dealt with any town—at least, in the north of England—they had also to deal with the whole force of the organised associations in the county, or, indeed, in the whole country. Now, every question was argued before the Conciliation Boards, and was settled by argument and reason rather than by the clumsy and foolish arbitrament of strikes and lock-outs. As the masters became organised they realised that there were other purposes to which they might apply themselves. As an instance of this side of the work, he referred to the form of contract which had been agreed to by the Institute of Architects and the builders. He said this was perfectly fair, and protected the interests of all sides. The time was fast coming when they would be able, as an organisation, to say that they would have that contract and no other, and when that was achieved they would be saved a great deal of trouble, and in some cases a great deal of injustice.

Mr. J. Biggin replied on behalf of the Yorkshire Federation.

Other toasts were "The Sheffield Master Builders' Association," proposed by Alderman Judge, of Wakefield, and replied to by the President; and "The Visitors," given by Mr. J. D. Cook, and acknowledged by Mr. A. Nunweek.—*Sheffield Telegraph.*

Competition News.

BUILDING SCHEME, CHANCERY-LANE, W.C.

A block of offices are to be erected in Chancery-lane on the site of Old Sergeant's-inn by the Law Union and Rock Insurance Company, Ltd., whose head offices are now at 126, Chancery-lane. The architect has not yet been appointed, but a selection, it is expected, will be made (by competition) in the course of about a month.

Trade Catalogues.

MR. O. N. BECK sends us a catalogue of Bohn's clay cleaner, a machine designed for the extraction of stones, chalk, lime, and other foreign substances from every kind of clay used in making bricks and tiles, thereby obviating the necessity of employing crushing and grinding mills, which merely subdivide impurities instead of removing them, or of using washing apparatus whose efficacy is not particularly marked. The operation of Bohn's machine may be thus briefly described:—Raw clay fed into the hopper is engaged by a worm conveying it to the purifying chamber, which contains screens with holes of from 1½ to 6 millimetres diameter. Through these the clay is pressed by means of the worm, while the impurities are conveyed backwards into a collecting chamber, whence they are removed from time to time. The purified clay leaves the machine in threads, only the soft particles being pressed through the screens. The machine is made in five types, with the output of from 6 tons to 26 tons per day of ten hours, and requiring from 5 to 25 horse-power for operation.

BOOK RECEIVED.

NEW MAP OF METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS. (E. Stanford. 4s. 6d. mounted in case; 2s. in sheet form.)

Correspondence.

THE SITE OF THE GLOBE THEATRE, BANKSIDE.

SIR,—Under the above heading reference is made in your issue of the 26th ult. to the position of the site of the Globe Theatre of Shakespearian renown. In this reference an attempt is made to locate the site within the present confines of Messrs. Barclay, Perkins's Brewery.

Unfortunately for this contention, the contemporary maps show that the theatre was on Bankside, and not on the south side of Park-street, and this evidence is the best that is available.

The writer of the article in question, instead of relying upon this evidence, cites the testimony of a lady who believed herself to have seen the remains of the structure. This lady was Mrs. Thrale; she recounts that her "fate was bound up with the old Globe Theatre upon the Bankside, Southwark, the alley it had occupied having been purchased and thrown down by Mr. Thrale. . . . When it lay desolate . . . there were really curious remains of the old Globe Playhouse, which, though hexagonal in form without, was round within."

The writer who quotes this goes on to say that "Authentic maps show there can be no question that Globe-alley, built after the pulling down of the theatre in 1644, stood within the confines of Barclay & Perkins's Brewery." This has never been disputed.

But Mrs. Thrale does not say that the alley to which she refers was Globe-alley; she only speaks of Bankside. May it not have been Bearsfoot-alley which was in her mind? This is shown on Rocque's Plan of London, 1746, and then occupied the site upon which the Globe Theatre appears in the older maps. Globe-alley, on the other hand, appears to have no connexion, except in name, with the theatre which was pulled down in 1644. Having been built after the theatre was pulled down, it could not have led, in the words of the conveyance of 1732, "in antient times from Deadman's Place . . . to the Globe Playhouse." GEORGE HUBBARD, F.S.A.

*** Mrs. Thrale writes in her MS. note—"The alley it [the Globe Theatre] had occupied having been purchased and thrown down by Mr. Thrale to make an opening before the windows of our dwelling-house." The Thrales's town house stood in Deadman's-place, on the east side of the brewery. In Rocque's map, 1746, Bear'sfoot-alley is plotted as leading southwards from the riverside, but stopping short of Maid-lane, and therefore at some distance from the brewery (which lay to the south of Maid-lane), and also from Deadman's-place. The conveyance of 1732 cites "the *then* Globe Playhouse." It seems that the contemporary maps cited by Mr. Hubbard are the XVIIth-century views and bird's-eye drawings, which, when an actual site is in question, are less authoritative than planned maps and surveys. —THE WRITER OF THE ARTICLE.

General Building News.

CHURCH REBUILDING, TREDEGAR.

Penuel Welsh Calvinistic Methodist Chapel, Tredegar, was recently reopened after being rebuilt and entirely remodelled, at a cost of 2,275*l.* The architects for the work were Messrs. Habershon & Fawckner & Co., Newport, and the builder Mr. Rees Edwards, Tredegar.

ROMAN CATHOLIC CHURCH, TORRY, N.B.

The Roman Catholic community in Torry is about to undertake the erection of a church and presbytery for the district. The building will cost about 4,000*l.*, and will seat 400 people. The architect is Mr. Charles J. Menart, of Glasgow. The mason work will be executed by Mr. David Weir, the carpenter work by Mr. Mercer, the slater work by Mr. John Durnin, and the plaster work by Mr. Bannochie.

WESLEYAN SUNDAY-SCHOOL, BUDE.

Foundation-stones have been laid at Bude of a new Wesleyan Sunday-school. The architect is Mr. E. Wise, of Launceston, and Mr. W. A. Beckly, builder, secured the contract at 2,653*l.* The buildings include an assembly-hall, several classrooms, and the usual offices, with a caretaker's residence.

SCHOOL-CHAPEL, POOLE.

The Baptists of Poole are erecting a new building for the purpose of a Sunday-school and evening services. The designs have been drawn by Mr. J. W. Jones, and the contract has been given to Mr. Geo. F. Ivemy, of Poole.

PROPOSED COUNCIL SCHOOL, DUNSTABLE, BEDS.

The Bedfordshire Education Committee have received from Messrs. Gotch & Saunders the plans for the new Council school at Dunstable. These plans have been forwarded to the Board of Education, and, if approved, tenders for the erection of the new school will be invited by advertisement.

COUNCIL SCHOOL, KIRBY MUXLOE, LEICESTERSHIRE.

The school, recently opened, is for mixed scholars, and will accommodate 220; an addition has been provided for forty. There are three classrooms for forty scholars each and two for fifty. Two of these have a folding partition between to allow of them being used as one room when necessary. The whole of the classrooms surround a central hall, and all are placed to obtain sun at some part of the day, no rooms being north. The heating medium is on the low-pressure hot-water circulating system; the heating surfaces in the rooms consist of exposed piping and radiators fitted with stop valves so that the heat can be shut off when desired. The vitiated air is extracted through openings at ceiling and floor level through flues formed in the wall and connected to a ventilating duct formed under the floor of the large hall. The main extraction duct delivers into the vertical upcast shaft, through which is carried the smoke pipe from the boiler, so that when the boiler is at work the heat from the smoke will assist the ventilation by causing an upward current in the

shaft. The floors to hall, corridors, and class-rooms have been executed in pitch-pine blocks, the cloakrooms being finished in Venetian marble mosaic. The playgrounds are paved with limestone tar-paving. The exterior has been executed with red sand-faced bricks, and Ketton stone dressings. Mr. Walter Brand is the architect.

PROPOSED RECONSTRUCTION OF THE GLASGOW ROYAL EXCHANGE.

It is proposed to carry out a scheme of reconstruction at the Glasgow Royal Exchange. The scheme provides for increased area in the hall, greater accommodation and more modern equipment in the matter of writing-rooms, cloakrooms, etc., while the provision of a smoking-room and restaurant in the basement has also been suggested. Two stories will be added, and this will increase the space available for letting as public offices. It is said the intention is to remove the present side entrance stairs, which will allow of an extension of the floor, and thereafter erect a new entrance at the west end of the building. Mr. Alexander N. Paterson has drawn up plans.

BUSINESS PREMISES, DONCASTER.

At the principal entrance from the Bridge-road, Doncaster, a new block of business premises has been erected for Mr. F. G. Simpson, seed and cake merchant. The new premises provide for both the retail trade in the front shop and the wholesale trade in a large warehouse beyond, the two branches being supervised from a central office. The material used on the elevations is entirely of "Marmo," supplied by the Leeds Fireclay Company, Ltd. The contractors for the works are Messrs. Dennis Gill & Son, of Doncaster, and the building is being carried out from the designs of Mr. F. Norman D. Masters, M.A., architect, of Doncaster.

PROPOSED PUBLIC HALL, NEWCASTLE-ON-TYNE.

A company has been formed for the purpose of providing in Newcastle-upon-Tyne a hall (proposed to be called the Queen's Hall) suitable for public meetings, concerts, and entertainments of all kinds. The buildings proposed to be erected will cover the whole of the site, and, in addition to the hall itself, which will be about 138 ft. by 80 ft., and about 40 ft. high to the cornice line, and with galleries or elevations at the sides and end, will comprise an extensive basement of over 2,000 yds. in extent, and blocks of shops and warerooms and offices. The hall will seat about 3,500 persons. Plans of the proposed buildings have been prepared by Messrs. Graham & Hill, architects, of Newcastle-upon-Tyne, and these plans, which have been passed by the Corporation, have been submitted to and approved by Mr. R. J. Leeson, architect, and Mr. J. T. Cackett, architect, both of Newcastle-upon-Tyne.

HENGLER'S CIRCUS, ARGYLL-STREET.

Messrs. F. Matcham & Co. have prepared the designs for the reconstruction, as the London Palladium, of Hengler's Circus, at an estimated outlay of 200,000*l.*, the present front being retained. The new auditorium will accommodate a total of about 3,400 persons, and there will be a large restaurant, saloons, reading-room, and library. The premises were opened by the late F. C. Hengler as a place of entertainment on, we gather, the site of Argyll House—which the Duke of Argyll sold in 1820 to George, Earl of Aberdeen—as the Cirque in 1872. They were reconstructed by C. J. Phipps, at a cost of over 10,000*l.*, and reopened, in January, 1896, as the National Skating Palace.

RHYL PIER.

The promoters of the scheme for extending Rhyl Pier into deep water have instructed the architects and engineers, Messrs. Maxwell & Tuke, of Manchester, to obtain estimates for the whole of the works, and intend to let the contracts immediately upon the receipt of the provisional order. The scheme is a large one, involving a capital of some 65,000*l.*, and includes encasing the present iron pier in ferro-concrete, widening it, and extending it seawards by means of a ferro-concrete jetty some 600 yds. The landing-place at the head of the jetty will be constructed in Tasmanian blue gum. The present pier head will be considerably enlarged, and an open-air inclosure with band kiosk erected on it. There will also be, in immediate connexion with the pier, a visitors' club, with reading, billiard, and smoke rooms, twenty-four shops, and two tea-rooms.

PROPOSED ENLARGEMENT OF THE WORKHOUSE, READING.

The Reading Board of Guardians have decided on a scheme, involving an outlay of 12,000*l.*, for the enlargement of the workhouse. Mr. W. Roland Howell, the Guardians' Architect, has prepared plans for an aged and infirm block, new committee-room, and mortuary, and alterations to the master's office and matron's stores at the workhouse, and these designs have been provisionally approved by Mr. Kitchen, Architect to the Local Government Board. Tenders are to be invited for the work, but from Reading builders only.

EXTENSION OF THE PARADE, YARMOUTH.

Mr. H. Shelford Bidwell, Local Government Board Inspector, recently held a public inquiry relative to the Yarmouth Corporation's application for sanction to a loan for the extension of Marine-parade North, as distress work. The Borough Surveyor, Mr. J. W. Cockrill, was present, and gave evidence. The amount of the loan for which sanction was sought was 2,500*l.*

DENTAL HOSPITAL, LIVERPOOL.

The new Dental Hospital, which is situate at the corner of Pembroke-place, Liverpool, has just been opened. The building contains a waiting-hall, anæsthetic-rooms, laboratories and workshops, students' rooms, lecture-hall, with museum and library, and on the top floor the operating-room. The cost of the building will be approximately 10,000*l.*, and the architect is Mr. G. De C. Fraser.

DRILL-HALL, ASHFORD.

A new drill-hall is being erected by the Kent County Territorial Association for the use of the various Territorial units at Ashford. The contract was secured by Messrs. G. E. Wallis & Sons, builders and contractors, of Maidstone, their price being 5,079*l.* Mr. F. G. Hayward, of the firm of Messrs. Worsford & Hayward, Dover, is the architect. The hall will be 100 ft. long and 50 ft. wide. The floor will be laid with patent Jarrah wood blocks. The rest of the flooring will be formed of the Kleine patent fire resisting material, to be laid by the patentees themselves. The roofs will be covered with special Sternit asbestos. The bricks will be procured from the Ashford Brick and Tile Company, Ltd., and the Pluckley Brick and Tile Company. The whole of the work is under the personal supervision of Mr. C. Standing.

PROPOSED HOSPITAL, STAINES.

The Staines Joint Hospital Committee have approved plans submitted by Mr. Manning for the hospital which the Council propose to build. The estimated cost of the building is 3,500*l.*, including the isolation block.

IMPROVED GUARDIANS' OFFICES, READING.

The Reading Board of Guardians have enlarged and improved their offices and board-room in Thorn-street, Reading, at a cost of about 1,500*l.* The one-story building fronting Thorn-street has been made two stories high, the new upper floor providing a suite of offices for the Clerk to the Board and his assistants. The buildings are heated partly by open fires and partly by radiators and coils. Mr. H. C. Goodman was the heating engineer, and provided the new "Robin Hood" boiler and radiators, etc. Fireplaces were supplied by Messrs. Callas, Sons, & May, sanitary fittings by Messrs. Twyfords, Ltd., and the electric lighting was executed by Messrs. Baughan & Co. Mr. McCarthy E. Fitt was the general contractor, who has carried out the work under the supervision of the architect, Mr. F. W. Leslie, of Reading.

NEW LIBRARY, ST. ALBANS.

The new Public Library for St. Albans is to be erected on the northern side of Victoria-street. Having decided upon the site, the Corporation invited the architects of St. Albans to send in designs in competition, appointing Mr. A. W. S. Cross, M.A., Vice-President of the Royal Institute of British Architects, as assessor. From among the seven designs sent in the assessor selected that of Mr. Guildford W. Dudley for first place, and the St. Albans City Council accepted this design. The building will be carried out in red brick and Corsham Down white stone, with a roof of green Westmorland slates, in diminishing courses, quoins of the white stone being inserted on either side of the front elevation. It is to consist of a basement, ground floor, and first floor, and will stand back 12 ft. from the roadway, a 4 ft. 6 in. area being surrounded by a wrought-iron railing, with the arms of St. Albans worked in on panels. The library will be approached by five stone steps, and through a stone doorway, leading into a stone-paved vestibule and small hall. On the right will be a children's room, and on the left the staircase and librarian's office. In front will be the lending library. This will cover an area of 48 ft. by 32 ft. 6 in., and will be top-lighted. Leading out of the lending library, and divided from it by a glazed partition, will be the newsroom, 48 ft. by 23 ft. 6 in. On the first floor there will be, over the children's room, a magazine-room, to be separated from the reference library, which will be above the newsroom, by movable glazed partitions and a staff enclosure. Over the librarian's office will be a room reserved for ladies, and between that and the magazine-room will be a mending-room. In the basement will be a heating chamber. All the floors of the building will be fireproof, consisting of steel joists and concrete, with the surfaces finished in cement. The stairs will also be of fireproof construction, faced with hardwood, and having wrought-iron balustrade and oak handrails. It is proposed to light the building by electricity, and to heat it by a low-pressure hot-water apparatus.

Sanitary and Engineering News.

ROYAL COMMISSION ON SEWAGE DISPOSAL.

The following official statement has been issued:—This Commission was appointed in May, 1898, and on July 12, 1901, they issued an interim report. On July 7, 1902, they issued a second report, presenting reports on certain chemical and bacteriological investigations in relation to sewage disposal, which had been made under the direction of the Commission. On March 2, 1903, the Commission presented a third report dealing with trade effluents, and the setting up of river boards and a central authority for the purpose of settling disputes between manufactures and local authorities, and for the better protection of rivers and other waters. On December 28, 1903, the Commission presented a fourth report dealing with the dissemination of disease by means of contaminated shellfish and other evils caused by the discharge of impurified sewage and trade effluents into tidal waters. This report contains the recommendations of the Commission for remedying these evils. The fifth report, which was presented in 1908, dealt with the main question of what methods of sewage disposal may properly be adopted by local authorities. A sixth report dealing with the disposal of distillery effluents was presented on February 9, 1909. The Commission are now investigating the question of the disposal of trade effluents (other than distillery effluents) when not mixed with sewage, and are continuing observations on the effect of discharging effluents of known composition into streams, with a view to reporting more fully on the question of standards and tests. They are also investigating the conditions under which green growths, such as Ulva latissima, are fostered in estuaries, and how they may be prevented.

SEWAGE EXTENSION SCHEME, TUNBRIDGE WELLS.

Mr. A. A. G. Malet, M.Inst.C.E., held an inquiry at the Town Hall, Tunbridge Wells, on the 22nd ult., in respect of a proposed new borough loan to the amount of 67,000*l.* for sewage extension works at and from the pumping-station near Hurst Wood. Mr. Maxwell, the Borough Engineer, was present, and explained the details of the scheme.

GARGUNNOCK WATERWORKS.

The formal opening has just taken place of the Stevenson Memorial water supply works and fountain at Gargunnock. The source of supply is the Gargunnock Burn, which takes its rise in the hills to the south of the village. The total length of the various conduits from intake to tank is about 140 yds. The tank has a capacity of about 33,000 gallons. The engineer of the scheme is Mr. T. O. Niven, C.E., Glasgow. The contractors are Messrs. Casey & Darragh, Stirling, and Mr. A. M. Lupton acted as resident engineer.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.

Messrs. E. Shorland & Brother, warming and ventilating engineers (Manchester), have converted their business into a private limited company, and the style of the firm is now "E. Shorland & Brother, Ltd."

HOUSE BUILDING AND RENTS IN FLORENCE.

Major W. P. Chapman, British Consul-General in Florence, in a report to the Foreign Office, states that house rent in that city has been much on the increase, especially since 1906, and although still lower than in some other large Italian cities it may be anticipated with certainty that it will attain the same level before long. The annual rent per room for apartments for the middle classes varies at present in Florence from 4*l.* 16s. to 7*l.*, as compared with 5*l.* 4s. to 10*l.* in Rome. In the fashionable quarters the figures are much higher. In the other large cities apartments, however small, have greater comforts, and are furnished with gas for heating and kitchen purposes, which is not the case in the small apartments in Florence. In 1908 there were

built 522 new houses, with 3,279 rooms; of these houses forty-one were for wealthier people, 370 for the middle class, 109 for workmen, and two for peasants. There is a growing demand for small lodgings for workmen and persons of very small means. Cottage building, which is now being undertaken with considerable activity in various quarters on the northern side of the city, and especially in that large zone on the side of Montughi, San Domenico, San Gervasio, and San Salvi, will never solve the problem of lodgings at Florence. The houses now being built for the most part by co-operative societies consist chiefly of small cottages or *villinos* of from six to fifteen rooms for the use of their own members, who, in the majority of cases, occupy half of the house and let the other floor to some tenant on no better terms than those already mentioned. A *villino* serves for two families only. On the other hand, there is continual pulling down of old houses, especially on the south side of the Arno, and there will soon be the demolition of all the houses near the station for the enlargement of the station. The system of building one-storied cottages with gardens, rather than large houses, is peculiar to Florence, and, although excellent from a sanitary point of view, takes very large areas of ground for a restricted number of families, and naturally is onerous to the municipality, who have to make streets, drainage, provide for lighting, etc.

MIDDLESEX COUNTY COUNCIL.

Sanction was given at the last meeting for expenditure up to 700*l.* for making an examination of the foundations of Kingston Bridge. The work is to be carried out by a contractor approved of by the joint Committee on a schedule of prices, prepared by Mr. Basil Mott, M.Inst.C.E. Messrs. Treasure & Son, Ltd., Upper Holloway, N., are to erect a new Council school in Western-road, Southall, the contract price being 11,475*l.*

PLANS FOR THE EXTENSION OF GREATER BERLIN.

Of the twenty-seven entries in the competition for plans for the extension of Greater Berlin, not one was considered sufficiently successful to merit the award of the first premium of 30,000 marks. The jury unanimously agreed to avail themselves of their full powers, and to award the value of the first and second premiums in equal shares of 25,000 marks each to Herr Jansen, of Berlin, and Messrs. Brix & Genzmer, of Berlin; the third and fourth premiums were awarded, but not the fifth. Four other schemes were purchased, including one by Herr Jansen, at prices varying from 2,000 to 5,000 marks, and thirteen authors awarded 1,500 marks each as compensation for time and labour.

COLLAPSE OF A FERRO-CONCRETE BUILDING.

At Bercy, France, a ferro-concrete building has recently collapsed in course of erection. According to the opinion of experts, the work was irreproachable from a technical point of view. There was no superincumbent weight when the centring was removed, which is rarely the case when accidents occur; the collapse took place when concrete was being laid on the top floor with a view to forming a terrace. The reason assigned is that an overslow setting cement had been used in parts of the building. The conclusions to be drawn are:—That cement used on such works should be closely examined; that the purveyor of the cement should guarantee the identity and setting power of material supplied, and that no mortar cement should be used in ferro-concrete work, as this latter requires special care and precaution.

DESTRUCTION OF THE PALACE OF THE DUKES OF URBINO.

A landslip, near Gubbio, has destroyed, in the Palace of the Dukes of Urbino, one of the finest historical monuments of Italy. The building, dating from the Renaissance, was situated on the slope of Mount Ingino. The falling rocks crashed through the roof, ruining the fine ceilings and splendid mural decorations of the Tuscan School of the XVIth century.

ST. MARK'S CAMPANILE.

The British Consul at Venice, in his annual report, which has just been issued by the Foreign Office, states that the brick masonry of St. Mark's tower has been finished, and the building of the belfry is being proceeded with. A new scaffolding has been fixed, and the old one will soon be removed. The magnificent piece of architecture called the "Loggetta," as it was slightly elevated from the ground by Sansovino, is being reconstructed under the arches of the courtyard of the Doges' Palace. After its collapse measures were at once taken to collect all the precious fragments that could be recovered. Fortunately, the bronze statues by Sansovino, representing Minerva, Apollo, Mercury, and a God of Peace, together with the gates by the founder Gai, were not much damaged, and they were again put up in their pristine state. The terra-cotta Madonna with Child and St. John the Baptist, also by Sansovino, that had been picked up in 1,600 fragments, was wonderfully restored by Pietro Zei. A great part of the material constituting the façade of the logetta, such as columns, pilasters, niches, etc., has been, wherever possible, restored or identically replaced. Its reconstruction may now be seen minus the attic, which is now under reconstruction in another place, and will soon be removed. With respect to the marbles and the other materials employed, a most careful selection has been made with a view of ensuring an identical reproduction of the splendid monument that was buried under the *débris* of the Campanile.

BUILDING WORK IN VENICE.

In his latest report to the Foreign Office the British Consul at Venice mentions that cotton docks have been erected at Sacca Fisola, opposite the maritime station, by the cotton merchants in Northern Italy, who have formed a limited liability company. There is a building for the offices and for the director; there are electric workshops and a dwelling-house for the employees. This company is laying down another large plant for a similar purpose at Mestre.——The flour mills at the Gindecca have lately been enlarged and improved. They are growing every year more important, which necessitates constant additions.——The continual prosperity of the Port of Venice has rendered it necessary to provide for larger accommodation for ships in the maritime station. The first part of the works which are in contemplation, for a sum of about 240,000*l.*, has recently been assigned to Signor Edourdo Almaigà.——The works for widening the lagoon railway bridge for a length of about 650 metres, in order to lay down four new tracks for the conveyance of goods, have been energetically carried on.——A large railway plant has been installed at the Catene, near Mestre, with up-to-date equipment, and 600 houses for railway employees are being built along the road leading to the Rana.——The progressive increase in the size and draught of battleships has rendered it necessary to have a larger graving dock built at the arsenal. The works, on the back part of the arsenal fronting the Island of Murano, are being carried out in accordance with the plans prepared by the Ministry of Marine.——Progress is being made with the construction of several new railways in the province.——The overcrowding of the people of Venice and the demand for dwellings, chiefly by the poor and middle classes, would seem to be a most urgent and difficult problem. Speculators are working on all sides, buying all the houses they can, dividing them into small apartments, and then greatly raising the rents. The land in the neighbourhood of Venice and also of the other towns in Venetia is sold for building purposes by the square metre at enormous prices.——The cement plant put down at the Gindecca some years ago, and which is a branch of the lime and cement factory at Casal Monferrato, has lately been enlarged, and new rotary kilns and tube mills have been introduced to make Portland cement. Their produce is accepted for Government works, as the company guarantee it to correspond to all requirements for reinforced concrete structures.——A large plant for making patent fuel has been laid down at Mestre by the Carbomfera Italiana Company, which has similar establishments at Genoa, Rome, and other towns.——Another important establishment, occupying an area of about 25,000 square metres, has been erected at Mestre for the preservation of timber by a creosoting process.——The importation of foreign tinplate has been greatly injured by the protective tariffs, which make it impossible to compete in price with the Italian manufacturers. Black plates, however, continue to be imported, chiefly from the United Kingdom. ——The numerous establishments making building materials, as bricks, lime, cement, iron, etc., have realised large profits, and have still important orders in hand, which will ensure work for a long time to come, as dwelling-houses are being erected in all parts.—— The Venetian glass trade continues to flourish. ——Wrought-iron has became a large industry, and a great quantity of it is exported, such as armour, iron gates, lamps, mountings for furniture, and finely-modelled examples of other iron works.——Reproductions in marble and composition, such as statues, vases, wall parapets, and chimneypieces in all styles, are everywhere on view in great quantities.

THE GARDNER COLLECTION.

Failing the purchase of this collection in its entirety, Messrs. Sotheby are making arrangements to sell it by auction on ten afternoons in May; the detailed catalogue which they have prepared will be issued shortly, and is, we believe, the first that has been made of the maps, prints, and drawings comprised in the collection. The Corporation of the City of London have declined to become the purchasers at a price, it is stated, of nearly 20,000*l.*, yet a hope is still entertained that some public body or private individual will make such an offer as will avert the dispersal of the portfolios in lots at auction.

VENTILATION OF PUBLIC BUILDINGS.

The Royal Sanitary Institute have appointed Professor Henry Adams, of the firm of Henry Adams & Son, and Dr. Louis C. Parkes as their representatives upon a joint Committee which is being formed by the Institution of Heating and Ventilating Engineers to consider the question of legislation in connexion with the ventilation of public buildings.

THE NEW GALLERY, REGENT-STREET.

These premises, which were recently acquired for conversion into a restaurant, were originally erected as a store for the sale of meat and other provisions. In 1888 they were adapted as the New Gallery by Mr. C. E. Hallé and Mr. J. W. Comyns Carr, who were joined in their enterprise by Burne-Jones, Watts, and other artists, who had withdrawn from the Grosvenor Gallery in New Bond-street. The architectural treatment of the interior for its new purpose was carried out from the designs and under the superintendence of Mr. E. R. Robson. In addition to the periodical art exhibitions, those of the Arts and Crafts Society and the collections of works by masters of the British and Flemish schools, the New Gallery formed the scene of some memorable historical exhibitions. Amongst the last named were those relating to the royal houses of Stewart, Hanover, and Brunswick, in 1889-91, and the Sovereigns of Great Britain and Ireland, in 1902; in 1893 and 1899 were held exhibitions of the art of Burne-Jones. The International Society, who have recently migrated to the Grafton Galleries, first occupied the New Gallery six years ago.

CRAVEN-STREET, STRAND.

The freehold building site of Nos. 9-10, Strand, and Nos. 1-20, Craven-street, covering 20,100 ft. superficial, will shortly be offered for sale at the Mart. No. 7 in Craven-street (formerly Spur-alley) was the home for a while of Benjamin Franklin; amongst other famous residents we may mention Mrs. Cibber (until 1746); Akenside, in 1759-61; and James Smith, author of some of the Rejected Addresses.

LAND VALUES IN THE CITY OF LONDON.

Adverting to our "Note" of March 5 upon the contrasted values of building land in the cities of London and New York, we may mention further that, in July, 1901, the site of No. 37, Cornhill, was sold at the rate of 54*l.* 5s. 1¼d. per square foot (or 2,363,360*l.* per acre); in January, 1903, the site of No. 1, Old Broad-street, at the rate of 70*l.* 4s. 8d. per square foot (or 3,059,390*l.* per acre), and in May, 1897, the site of No. 10, Lombard-street, at the rate of 41*l.* 0s. 1¾d. per square foot (or 1,786,300*l.* per acre).

UNIVERSITY OF LIVERPOOL.

In the examination held at the termination of the first session of the School of Civic Design of the University of Liverpool, the following students have been successful, and will be awarded the Certificate in Civic Design, viz.:—Mr. G. N. Dixon, Mr. S. A. Kelly, Mr. R. J. Pearson, and Mr. F. B. D. Stalker.

Capital and Labour.

STATE OF EMPLOYMENT IN THE BUILDING TRADES.

Employment in February, though still slack, was better than both a month ago and a year ago. The percentage of trade union carpenters and joiners unemployed at the end of February was 11·3, as compared with 14·4 a month ago and 14·5 a year ago; and for plumbers, at the same dates, the percentages were 8·5, 11·7, and 12·0 respectively. These percentages were always exceeded in the northern counties, where many of the trade union members are engaged in shipbuilding. In Yorkshire, Lancashire, the East Midland Counties, and Wales the percentages unemployed were always below the average for the kingdom. Returns received from trade unions of bricklayers, painters, and slaters show an improvement in employment compared with both a month ago and a year ago. Returns from plasterers and labourers show little change compared with a month ago, but an improvement compared with a year ago. Returns from masons show little change

compared with both a month ago and a year ago. Returns received from 700 firms employing 41,095 workpeople at the end of February show that there was an increase in the total number employed of 8·8 per cent. compared with a month ago, and of 3·0 per cent. compared with a year ago. Compared with a month ago every district showed an increase, while compared with a year ago the only district showing a decrease was the Midland and Eastern Counties.—*Board of Trade Labour Gazette.*

Law Reports.

LONDON BUILDING ACTS (AMENDMENT) ACT, 1905.

ON March 21 Mr. H. Buckeridge, of 293, Walworth-road, was summoned before Mr. Hopkins, at Lambeth Police Court, by Mr. Bernard Dicksee, District Surveyor for Newington, etc., for neglecting to give notice to the District Surveyor, as required by sect. 145 of the London Building Act, 1894, and sect. 27 of the London Building Acts (Amendment) Act, 1905, of certain works done to 293, Walworth-road. The building in question is one that comes within the operation of sects. 10 and 12 of the Act of 1905; the defendant had applied to the London County Council for exemption from these sections, and had received a consent to the omission of certain works required by sect. 10 (projecting shops) on condition that certain other works were done, and that sect. 12 (access to roof) be complied with to the approval of the District Surveyor. Defendant had done certain works purporting to be a compliance with the special consent, but had given no notice to the District Surveyor as required by the Acts. The District Surveyor had discovered the works, which did not comply either with the Act or the special consent, and would have to be amended.

Mr. Hopkins held that notice should have been given, and fined defendant 10s. and 12s. 6d. costs.

LONDON BUILDING ACT, 1904: CINEMATOGRAPH SHOW—DISTRICT SURVEYOR'S FEES.

ON March 23 Mr. H. S. Dinsley, trading as Mr. H. Goodge, late of 5, Tower Bridge-road, S.E., now of 13, Cecil-court, Charing Cross-road, was summoned before Mr. Rose, at Tower Bridge Police Court, by Mr. Bernard Dicksee, District Surveyor for Newington, etc., for the recovery of fees due under the London Building Act, 1894, to the District Surveyor in respect of the conversion of the shop at 5, Tower Bridge-road into a public building for use as a cinematograph show.

The District Surveyor discovered, in October, 1908, that the building in question was being used for the purpose of a cinematograph show; a screen had been erected across the shop, leaving a doorway less than 3 ft. 6 in. wide, and the hut in which the lantern was placed was at the street door end of the shop, so that in case of panic persons would have to pass it to get out. No notice was at the time given to the District Surveyor, but after pressure the District Surveyor succeeded in persuading defendant to give notice on December 9, 1908. The District Surveyor also objected to the construction of the arrangement and the use of the building as a public building as then constructed, and demanded, under sect. 79, certain alterations; all of these were complied with later, except one, for which proceedings were commenced at the Police Court in March, 1909, but as defendant gave up the building and ceased to use it as a public building the proceedings were abandoned. The present proceedings were for the recovery of the District Surveyor's fees, according to the scale for a public building, 2*l.* 1s. 3d., and 2s. the costs of the previous summons.

The defence was that the District Surveyor had no jurisdiction, and that no structural alterations had been made to the building.

The District Surveyor submitted that sect. 79 included, not only an alteration to a building, but also the conversion of a building erected for a purpose other than a public purpose into a public building, that it was not necessary that there should be an actual alteration to the structure, but that a mere alteration of use to that of a public building was sufficient. The attention of the magistrate was called to sect. 13 of the Act of 1905 upon this point. Prior to the passing of the Cinematograph Act the supervision of the District Surveyor was the only protection the public had in buildings of this class.

Mr. Rose held that there had been a conversion to a public building, and made an order for the payment of the fees, 2*l.* 3s. 3d., and 24s. costs.

Patents.

APPLICATIONS PUBLISHED.*

2,234 of 1909.—Adam Cunningham: Casements or fanlights.

4,746 of 1909.—Frederic Dan Huntingdon: Reinforced concrete structures.

5,141 of 1909.—Rowland Priest, Benjamin Millward, and William Morrall: Pulley blocks, hoists, and the like.

5,240 of 1909.—Denzil John Jarvis: Machines for abrading or surfacing wood floors and for analogous purposes.

6,493 of 1909.—John Henry Morgan: Holdfasts or clips for securing metal or other pipes in position.

6,880 of 1909.—John Jackson Brewer and Frederick Brewer: Contrivance for bending tubes, rods, bars, or the like.

8,675 of 1909.—William John Mellersh-Jackson (Société J. et A. Pavin de Lafarge): Manufacture of cements.

10,870 of 1909.—Harold Williamson Lake (Edward Blair McKay): Abrading tools and method of forming abrading surfaces.

12,979 of 1909.—Albert Gogarten: Vices.

13,479 of 1909.—George Harvey: Front bars of kitchen ranges and the like.

13,990 of 1909.—Ernest William Brock and the Bath Stone Firms, Ltd.: Construction of partitions, walls, and the like.

16,035 of 1909.—Thomas Octavius Webbe: Windows.

20,896 of 1909.—Abram Aly Frantz: Flexible wall, ceiling, and surface coverings.

23,851 of 1909.—Hugo John: Devices for cutting up girders and the like.

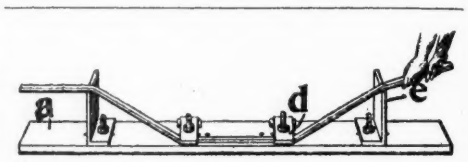
25,976 of 1909.—Max Wolff: Apparatus for drying bricks, tiles, cement, fruit, hops, peat, timber, and like materials.

26,598 of 1909.—Henry Green: Portable office.

29,721 of 1909.—Robert Leggott and W. & R. Leggott, Ltd.: Double-casement windows.

SELECTED PATENTS.

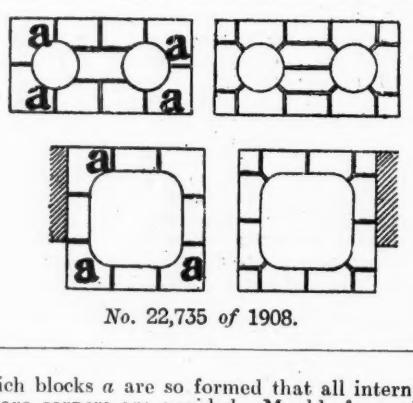
22,309 of 1908.—John McNay: Bending metal bars. This relates to a method of bending bars used in ferro-concrete constructions, according to which they are bent cold on a board *a*, carrying clamps *d*, which secure a given central length according to the holes



No. 22,309 *of* 1908.

through which the clamping-bolts pass, and angle-plates *e* also adjustable in the same manner as the clamps. The angle-plates are turned round at right angles while the first bend is being effected. The apparatus is portable, and the bolt heads may lie in recesses in the board.

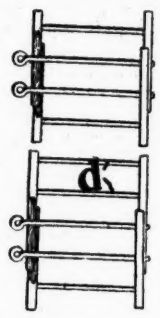
22,735 of 1908.—Heinrich Franke: Building blocks. This relates to building blocks for the construction of chimneys and ventilating shafts,



No. 22,735 *of* 1908.

which blocks *a* are so formed that all internal square corners are avoided. Moulds for making the blocks may be of metal cast in one piece, or may be made of wood.

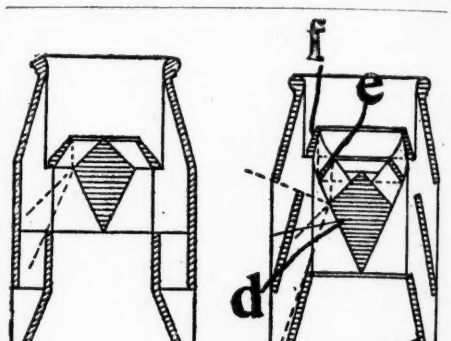
23,447 of 1908.—Albert Cornelius Parks: Ladders. This relates to sectional ladders, the ends of each section of which are respectively provided with tongues and grooves; the ladder is assembled by engaging the tongues of one section with the grooves of another section,



No. 23,447 *of* 1908.

removable rungs *d* holding the sections together.

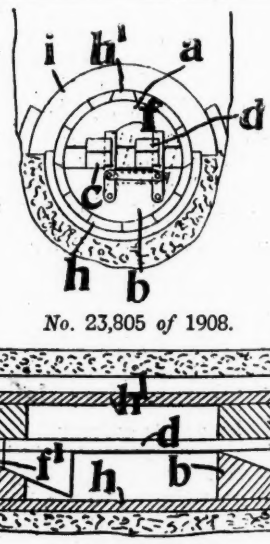
23,605 of 1908.—John Duncan MacLeod: Chimney-tops. This relates to chimney and ventilating shaft tops, and consists in providing a single or double pyramid or cone with one or more pyramidal or conical frusta arranged above it, supported within a chimney or ventilating shaft top having lateral openings between louvres or concentric shafts so as to



No. 23,605 *of* 1908.

deflect down draught into these openings. According to one construction a double cone *d* is supported within louvres above a contracted shaft *a*. The frusta *e*, *f* are such that the space between them tapers downwards, and their lower and upper ends may lie in the continuations of the surfaces of the lower and upper cones respectively.

23,805 of 1908.—Joseph Hayton (Robert Hayton): Centring for arches, culverts, etc. This relates to a collapsible mould, core, or centre, which comprises top and bottom members *a*, *b*, expanded by wedges *c* on striking bars *d*, which are locked by pivoted



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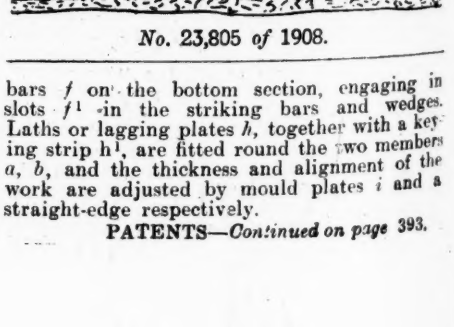

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bars *f* on the bottom section, engaging in slots f^1 in the striking bars and wedges. Laths or lagging plates *h*, together with a keying strip h^1, are fitted round the two members *a*, *b*, and the thickness and alignment of the work are adjusted by mould plates *i* and a straight-edge respectively.

PATENTS—*Continued on page* 393.

* All these applications are in the stage in which opposition to the grant of a patent upon them can be made.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvii.; Auction Sales, xxiv.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

APRIL 6.—**Stanley.**—DRINKING FOUNTAIN.—Designs and estimates of cost for the erection of a drinking fountain (memorial to the victims of the West Stanley Colliery disaster); height from 13 ft. to 15 ft. from base; material to be stated; cost from 115*l.*, and not to exceed 125*l.* (the foundation and the laying of water pipes not to be estimated for). Price per dozen letters to be stated. Tenders to be sealed and sent to Mr. James Smith, Secretary, Empire Club, Front-street, Stanley, S.O.

APRIL 29. — **Pontefract.** — COUNCIL SCHOOL.—The Education Authority invite competitive designs from architects practising in Yorkshire for the erection of an elementary school. Conditions of competition and plan of site can be obtained from Mr. W. Haddock, Town Clerk, on payment of 1*l.* 1s.

APRIL 30.—**Shardlow.**—SEWERAGE, ETC.—Shardlow R.D.C. desire to provide for the sewerage and sewage disposal of the contributory places of Spondon and Breaston, and they invite competitive schemes. Competitors to supply plans, sections, specification, detailed report, and estimate of the probable cost, which are to be delivered at the office of Mr. J. W. Newbold, Clerk to the Council, Becket-street, Derby.

MAY 31. — **Karachi.** — MUNICIPAL OFFICE. — **The Municipality of Karachi invite elevation designs and detailed plans and estimates for a new Municipal Office. For further particulars see advertisement in our issue of December 25.**

JUNE 15. — **Acton.** — NEW SCHOOLS. — The Acton U.D.C. Education Committee invite designs for new schools at Rothschild-road. For further particulars see advertisement in our issue of March 12.

AUGUST 23.—**Navan.**—COUNTY OFFICES.—Meath C.C. invite architects in Ireland to submit plans and specifications for the building of new County Offices at Navan. Copies of Sites Committee Report can be had on application from the Secretary, Meath C.C., Navan.

* NO DATE.—**Birkenhead.**—RECEIVING HOME.—The Guardians of the Birkenhead Union invite designs for proposed receiving home for children in Birkenhead. See advertisement in this issue for further particulars.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

APRIL 4.—**Abercarn.**—STORES.—The U.D.C. invite tenders for the erection of stores at Abercarn. Plans, etc., may be seen at the Council Offices, Abercarn.

APRIL 4.—**Newbridge.**—REPAIRS.—The Newbridge Town Commissioners invite tenders for repairs to artisans' dwellings and Town Hall. For further particulars apply to the Town Clerk.

APRIL 4.—**Newry.**—VILLA.—Building of a new villa on Windsor-hill for Mr. Robert Kerr, Newry. Copies of plans, etc., can be obtained on application from Mr. John Brown, architect, Kilmorey-street, Newry.

APRIL 4.—**York.**—PROPOSED ADDITIONS AND ALTERATIONS TO DE GREY HOUSE.—The York Corporation invite tenders for certain alterations and additions to De Grey House, St. Leonards. Drawings may be seen, and specifications, etc., obtained, on application at office of Mr. F. W. Spurr, City Engineer, Guildhall, York.

APRIL 5. — **Abercanaid.** — TEACHERS' ROOMS. — Merthyr Tydfil Education Committee invite tenders for the erection of head teachers' rooms at Abercanaid School. Particulars can be obtained from the Deputy-Surveyor at his office, Town Hall, Merthyr Tydfil.

APRIL 5.—**Ballycastle.**—DISPENSARY RESIDENCE AND DISPENSARY AT CUSHENDALL.—The Board of Guardians invite tenders for the above, in accordance with the plans, etc., prepared by Mr. T. J. O'Neill, C.E., which may be seen at the Board-room, Ballycastle Workhouse, during office hours.

APRIL 5. — **Bristol.** — WAREHOUSE.—Erection of an extension to a cold storage warehouse in Jervis-street, Barton Hill, Bristol, for Messrs. Eastmans, Ltd. Plans can be seen, and quantities obtained, at the offices of the architect, Mr. F. Bligh Bond, F.R.I.B.A., Star Life-buildings, St. Augustine's-parade, Bristol.

APRIL 5. — **Featherstone Provided School (Boys).** — ALTERATIONS.—Tenders required for the several works in connexion with alterations, folding screens, and extending urinal. Specifications at office of Mr. Charles Harris, Education Offices, Knottingley.

APRIL 5. — **South Reddish.** — PREMISES.—For new branch premises at South Reddish, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Copies of quantities may be had from Mr. Sagar Taylor, Secretary, on payment of 1*l.* 1s.

APRIL 6.—**Cockermouth.**—HOUSE.—For works required in erection of a house in Victoria-road, Cockermouth, for Mr. W. Leonard Parkin. Plans, etc., can be seen upon application to Messrs. W. G. Scott & Co., architects and surveyors, 2, Park-lane, Workington.

APRIL 6. — **Cowdenbeath.**—ALTERATIONS.—Alterations on and additions to business premises, High-street, Cowdenbeath, for the Cowdenbeath Co-operative Society, Ltd. Plans may be seen, and specifications, etc., obtained, at the office of Mr. William Birrell, architect and surveyor, 214, High-street, Kirkcaldy.

APRIL 6.—**Edinburgh.**—MASON WORK.—The School Board invite estimates for executing the mason work in enclosing additional ground at Broughton School, M'Donald-road. Plans may be seen, and schedules of measurement obtained, at the office of Mr. J. A. Carfrae, architect, 3, Queen-street.

APRIL 6.—**Messingham.**—HOUSE.—Erection of a house at Messingham, Lincolnshire. Plans, etc., may be seen, and forms of tender obtained, at the office of Mr. Alexander M. Cobban, 12, Home-street, Scunthorpe.

APRIL 6. — **Rathdown.** — REPAIRS TO COTTAGES.—Rathdown No. 1 R.D.C. invite tenders for the repairs of about eighty labourers' cottages in various parts of the district, in accordance with the specification prepared by the Council's Architect, Mr. R. M. Butler, A.M.Inst.C.E.I., to be seen at the Clerk's Office, Loughlinstown. Form supplied from office of Mr. Patrick Cunniam, Clerk of the Council, Clerk's Office, Loughlinstown.

APRIL 6.—**Skelmanthorpe.**—PAVILION. — Erection of a bowling pavilion at Skelmanthorpe for Mr. C. Field. Plans, etc., may be seen, and bills of quantities obtained, at office of Messrs. Brown & Shaw, architects, Dunford-road, Holmfirth.

APRIL 6.—**Skipton.**—TURBINE-HOUSE.—Pulling down of a stone chimney, 135 ft. high together with other buildings, and also for the erection of a new turbine-house, at Belle Vue Mills, Skipton, for the English Sewing Cotton Company, Ltd. Mr. James Hartley, architect, Skipton.

APRIL 7. — **Blaenavon (Mon.).** — HOUSES.—For four houses in Avon-road, near Lower Level Station, Blaenavon, for Mr. William Evans. Plans, etc., may be seen, and further particulars obtained, at the office of Mr. B. J. Francis, architect, Abergavenny.

APRIL 7. — **Chester Historical Pageant.**—GRAND STAND.—Erection of the grand stand on the Pageant Ground at Eaton, Chester. Plans, etc., may be seen, and bills of quantities, etc., obtained, at the offices of the honorary architects, Messrs. John H. Davies & Sons, 14, Newgate-street, Chester.

APRIL 7.—**Honley.**—HOUSE.—Erection of dwelling-house at Marsh, Honley. Plans may be seen, and bills of quantities obtained, at office of Mr. Joseph Berry, architect and surveyor, 3, Market-place, Huddersfield.

APRIL 7.—**Nafferton.**—COTTAGES.—Erection of six cottages at Nafferton for Miss Taylor. Plans, etc., can be seen at office of Mr. Joseph Shepherdson, architect, 91, Middle-street South, Driffield.

APRIL 7. — **Risehow (Maryport).** — OFFICE.—For works required in erection of office, laboratory, storehouse, and smith's shop at Risehow. Plans, etc., can be seen at the office of Mr. John Henney, architect and surveyor, 29, Senhouse-street, Maryport.

APRIL 7. — **Swansea.**—WAREHOUSE EXTENSION.—Extension of Victoria Warehouse for a distance of 67 ft., for the Harbour Trustees. Plans etc., can be seen, and forms of tender obtained, on application to the Trustees' Engineer, Mr. A. C. Schenk, M.Inst.C.E., at the Harbour Offices, Swansea.

APRIL 8. — **Birmingham.** — FIRE STATION.—The Watch Committee invite tenders for the erection of a fire station in Moseley-road, Highgate. Before obtaining the bills of quantities it will be necessary to deposit with the City Treasurer, Council House, Birmingham, a sum of 2*l.* 2s. Applications for forms of tender, etc., may thereupon be made at the office of the Quantity Surveyors, Messrs. Mansell & Mansell, 47, Temple-row, Birmingham. The drawings may be seen at the office of the architects, Messrs. Arthur Harrison & Cox, 109, Colmore-row, Birmingham.

APRIL 8.—**Coventry.**—BUILDING.—For new building, Hill Top, Coventry, for the Triumph Cycle Company, Ltd. Plans, etc., may be seen, and all particulars obtained, at the office of Mr. Herbert W. Chattaway, architect, Trinity-churchyard, Coventry.

APRIL 8. — **Huddersfield.** — EXTENSION.—Proposed extension of lavatories, etc., Friendly and Trade Societies' Hall, Northumberland-street. Plans, etc., at offices of Mr. W. Cooper, F.R.I.B.A., 4, Kirkgate-buildings, Huddersfield.

APRIL 8. — **Southampton.** — BUILDINGS. — The Southampton Harbour Board invite tenders for the erection of certain buildings at the platform, Southampton, and other works. Drawings, etc., may be inspected upon application to Mr. E. Cooper Poole, A.M.Inst.C.E., Engineer to the Board, and bills of quantities obtained upon payment of 2*l.*

APRIL 9.—**Cosford.**—ROOF WORKS.—The Guardians invite tenders for stripping and retiling a portion of the roof of the house at Semer. Specification prepared by Mr. Henry J. Wright, M.S.A., architect and surveyor, Ipswich, copy of which can be seen upon application to the Master at the House.

APRIL 9. — **Isleworth.** — SCHOOLS.—Heston and Isleworth U.D.C. (Education Committee) invite tenders for the erection of new schools and caretaker's cottage in Twickenham-road, Isleworth. The plans may be inspected at the office of Mr. J. G. Carey, Architect and Surveyor, Council House, Hounslow, where bills of quantities for the school buildings may be obtained on payment of a deposit of 2*l.* 2s.

APRIL 9. — **Newport.** — ALTERATIONS TO CORN EXCHANGE.—Alterations to the Corn Exchange, Newport (Mon.), for the Trustees. Drawings can be seen, and bills of quantities obtained, at offices of Mr. H. J. Griggs, A.R.I.B.A., architect, Metropolitan Bank-chambers, Newport (Mon.), on payment of deposit of 2*l.* 2s.

APRIL 11. — **Aberdare.** — VILLAS.—Erection of two semi-detached villas at Cwmaman, Aberdare, for Mrs. Jones and the Trustees of Moriah Aman Chapel. Drawings, etc., may be seen at office of Mr. J. Llewellin Smith, M.S.A., architect, Aberdare.

APRIL 11.—**Ashcott.**—SCHOOL.—For a new Council school at Ashcott, near Bridgwater, for the County Education Committee. Drawings, etc., can be seen, and further information obtained, at the offices of the architects, Messrs. Cottam & Samson, Bridgwater.

APRIL 11.—**Aylesbury.**—SEWAGE PUMPING STATION. —For new sewage pumping station, Mandeville-road, for the U.D.C. Plans, etc., may be seen, and bills of quantities, etc., obtained, on application to Mr. W. H. Taylor, Engineer and Surveyor, Town Hall, Aylesbury, upon payment of 2*l.* 2s.

APRIL 11. — **Codnor.** — SCHOOL. — Derbyshire C.C. Education Committee invite tenders for the erection of school, to accommodate 120 infants. Drawings, etc., at the office of the Architect to the Committee, St. Mary's Gate, Derby. A copy of the bill of quantities, etc., can be obtained at the Architect's Office upon payment of 1*l.* 1s.

APRIL 11.—**Northfield.**—CUBICLES.—King's Norton and Northfield U.D.C. invite tenders for the erection of cubicles at their hospital, West Heath, Northfield. Plans, etc., prepared by Mr. Ambrose W. Cross, A.M.Inst.C.E., of 23, Valentine-road, King's Heath, the Engineer and Surveyor to the Council. Two sets of tenders are required, as follows:—(1) For construction of steel glazed sashes; (2) general builder's work. Bills of quantities, etc., may be obtained, and plans, etc., may be seen at the office of the Engineer, on payment of a deposit of 1*l.* 1s.

APRIL 11. — **Sketty.** — POLICE-STATION.—Glamorgan Quarter Sessions and C.C. Standing Joint Committee invite tenders for the erection of a new police-station at Sketty. Plans, etc., can be seen, and copies of the bill of quantities and form of tender obtained, at the office of Mr. J. Jones Lewis, No. 7, Rutland-street, Swansea, Solicitor, and at Glamorgan C.C. Offices, Westgate-street, Cardiff.

APRIL 11.—**Withernwick.**—SCHOOL ALTERATIONS.—East Riding of Yorkshire C.C. Education Committee invite tenders for alterations and additions to the Council School at Withernwick. Plans, etc., may be seen, and forms of tender obtained, on application to the Building Surveyor, County Hall, Beverley.

APRIL 12. — **Banbridge.** — ADDITIONS TO TECHNICAL SCHOOL. — Banbridge Technical Instruction Committee invite tenders for building an addition to Banbridge Technical School, according to plans, etc., to be seen at the office of Mr. W. W. Larmor, A.Inst.C.E., Banbridge.

APRIL 12. — **Gilfach.** — STATION BUILDINGS.—The Directors of the Great Western Railway Company invite tenders for the erection of new station buildings, goods shed, etc., at Gilfach, Glamorganshire. Plans etc., may be seen, and forms of tender, etc., obtained, at the office of the Engineer at Newport Station.

* APRIL 12.—**Wrexham.**—TELEPHONE EXCHANGE.—The Commissioners of H.M. Works and Public Buildings invite tenders for a telephone exchange at Wrexham. See advertisement in this issue for further particulars.

APRIL 13.—**Chesterfield.**—INTERNAL ALTERATIONS TO STEPHENSON MEMORIAL HALL.—The Corporation invite tenders for the construction of a raking floor and other alterations to the Corporation Theatre, Stephenson Memorial Hall. Plans, etc., may be seen, and bills of quantities, etc., obtained, on application to the Borough Surveyor's Office, Saltergate, on payment of 1*l.* 1s.

BUILDING—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders may be sent in.

✱ APRIL 13.—**Herne Bay.**—PIER PAVILION.—The Herne Bay U.D.C. invite tenders for a pier pavilion on their new pier extension at Herne Bay. See advertisement in this issue for further particulars

✱ APRIL 13.—**Salisbury.**—ISOLATION HOSPITAL.—The Salisbury and District Joint Isolation Hospital Committee invite tenders for new isolation hospital. See advertisement in this issue for further particulars.

✱ APRIL 14.—**Weymouth.**—SCHOOL.—The Weymouth and Melcombe Regis Education Committee invite tenders for elementary school at Weymouth. See advertisement in this issue for further particulars.

APRIL 15. — **Bootle.**—ELEMENTARY SCHOOL.—The Corporation invite tenders for the erection and completion of a public elementary Council school, in the South-East District of Bootle, according to plans prepared by Messrs. Medcalf & Medcalf, architects, of 7, Moorfields, Liverpool. The plans may be seen at the Borough Engineer's Office, and the bill of quantities obtained at office of Mr. J. Henry Farmer, Town Clerk, Town Clerk's Office, Bootle, on making a deposit of 2*l.* 2*s.*

APRIL 16.—**Heywood.**—ADDITION.—The Heywood Education Authority invite tenders for the erection of an addition to the Heywood Technical School for a picture gallery and museum. The plans may be seen, and bills of quantities obtained, at the office of the Borough Engineer, Mr. J. Ainsworth Settle, A.M.Inst.C.E., Municipal Buildings, Heywood, by payment of a deposit of 2*l.*

APRIL 16.—**Heywood.**—EXTENSION TO SCHOOL.—The Heywood Education Authority invite tenders for the erection of an extension to the Heywood Technical School for day secondary school. The plans may be seen, and bills of quantities obtained, at the office of the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston, by payment of a deposit of 3*l.*

APRIL 16.—**Philipstown.**—SCHOOL.—For the erection of a new school at Philipstown, King's County, according to the plan, etc., to be seen at the Parochial House, Portarlington. Form to be obtained from the Manager, Rev. James Bergin, P.P., Philipstown, and must be accompanied by a detail (giving quantities and prices) in a separate sealed envelope.

APRIL 18.—**Belvedere.**—SANATORIUM EXTENSIONS.—The U.D.C. of Erith invite tenders for the erection of two additional wards and other extensions to the Erith Sanatorium, Little Heath, Belvedere. Bills of quantities, etc., may be obtained from Mr. Harold Hind, Surveyor, Council Offices, Erith, upon receipt of a deposit of 2*l.* 2*s.*

✱ APRIL 18.—**London, S.E.**—QUAY WALL.—The Camberwell B.C. invite tenders for new quay wall. See advertisement in this issue for further particulars.

APRIL 18.—**Oldcastle.**—REPAIRS.—The Board of Guardians invite tenders for the carrying out of certain repairs to the fireplaces, floors, etc., of the various wards of the Workhouse and Fever Hospital. Specification, prepared by Mr. Michael Grace, jun., the Board's Engineer, can be seen at Union Offices, Oldcastle Workhouse.

✱ APRIL 18.—**South Farnborough.**—EXTENSION TO WORKSHOPS.—The Secretary of State for War invites tenders for the completion of the superstructure of the extension to workshops at the Balloon Factory, South Farnborough. See advertisement in this issue for further particulars.

APRIL 19. — **Hazel Grove.** — SCHOOL.—Cheshire Local Education Authority (Administrative Sub-Committee for the Ashton-under-Lyne and Stockport Unions' District) invite tenders for the erection of a new public elementary Council school, Chapel-street, Hazel Grove, near Stockport, to accommodate 800 children. Plans, etc., may be inspected, and quantities obtained from the architect, Mr. C. T. Adshead, Leinster-chambers, 4, St. Ann's-square, Manchester, on payment of a deposit of 2*l.* 2*s.*

✱ APRIL 29.—**Leytonstone.**—SCHOOL.—The Leyton Higher Education Committee invite tenders for new County High School for Girls at Forest-road, Leytonstone. See advertisement in this issue for further particulars.

✱ MAY 3.—**London, S.E.**—BRANCH LIBRARY.—The Deptford B.C. invite tenders for a branch library in New Cross-road, S.E. See advertisement in this issue for further particulars.

NO DATE.—**Bewcastle.**—HOUSE.—Stone dwelling-house at Low Sowerbies, Bewcastle. Plans, etc., may be seen at the house of Mr. John Gosling, Redgate Head, Bewcastle, Newcastleton.

NO DATE.—**Bradford.**—ALTERATIONS, ETC.—Alterations and additions to premises, Market-street and Booth-street, for the Bradford District Bank, Ltd. (second contract). Names, together with a deposit of 1*l.* 1*s.*, to the architects, Messrs. Carby Hall & Dalby, Prudential-buildings, Park-row, Leeds.

NO DATE. — **Buckhaven.** — SLAUGHTER-HOUSE.—Offers wanted for the carpenter and joiner work required in connexion with the erection of a public slaughter-house for the Town Council of the Burgh of Buckhaven, Methil, and Innerleven. Forms of tender, etc., can be had from Mr. William D. Telfer, Burgh Surveyor, Municipal Buildings, Buckhaven, on payment of a fee of 1*l.* 1*s.*

NO DATE.—**Cork.**—LABORATORIES.—The Governing Body, University College, Cork, invite tenders for building new chemical and physical laboratories. Copies of quantities may be had on payment of a deposit fee of 1*l.* Plans, etc., may be had on application to the architect, Mr. Arthur Hill, B.E., F.R.I.B.A., M.R.I.A.

NO DATE.—**Hull.**—VILLA RESIDENCE.—Erection of a detached villa residence in Newland Park, Hull. Names to Messrs. Wellsted, Dosser, & Wellsted, architects and surveyors, Waterloo-chambers, Hull, together with a deposit of 2*l.* 2*s.*

NO DATE.—**Leeds.**—HOUSES.—Twenty-two houses off Cardigan-road, Leeds. Names to Mr. Fred Mitchell, architect and surveyor, 9, Upper Fountaine-street, Albion-street, Leeds (stating trade), at once.

NO DATE. — **St. Agnes (Cornwall).** — ENGINE-HOUSE.—The directors of Wheal Kitty and Penhalis United, Ltd., St. Agnes, invite tenders for building an engine-house. Specifications of the work required can be seen on application to Captain T. H. Prisk on the mine.

ENGINEERING, IRON, AND STEEL.

APRIL 5.—**Aberbaiden.**—BRIDGE.—The U.D.C. of Margam invite tenders for proposed joint bridge at Aberbaiden, Trissent, Margam. Plans, etc., may be seen, and form of tender obtained, by appointment with the Surveyor to the Council, Mr. John Cox, Port Talbot, on payment of a deposit of 1*l.* 1*s.*

APRIL 5.—**Southampton.**—REFUSE DESTRUCTOR.—The Corporation invite tenders for the erection of a four-cell refuse destructor and Lancashire boiler, and the construction of foundations. Plans, etc., may be seen, and forms of tender obtained, at the office of the Borough Engineer upon production of the Borough Treasurer's receipt for a deposit of 1*l.* 1*s.*

APRIL 6.—**Dundee.**—PLANT.—Dundee T.C. invite tenders for filtration and aeration plant at Dundee Public Baths. Particulars may be obtained at the office of Mr. Jas. Thompson, City Engineer, 91, Commercial-street, Dundee.

APRIL 9.—**Aberdare.**—ELECTRICITY SUPPLY WORKS.—The U.D.C. of Aberdare invite tenders for the construction of a generating station building, the supply and erection of plant, and the supply and laying of cables, etc. A copy of the specification, with general conditions and form of tender, may be obtained from Mr. Thos. Phillips, Clerk to the Council, Town Hall, Aberdare, on deposit of 1*l.* 1*s.* The drawings may be inspected at the offices of the Engineer, Mr. Stephen Sellon, 36, Victoria-street, Westminster, London, S.W., and at the office of the Surveyor to the Council, Town Hall, Aberdare.

APRIL 11.—**West Didsbury.**—WIRING, ETC.—The Guardians of the Poor of the Chorlton Union invite tenders for the wiring, etc., for electric light at the "Ins and Outs" Homes, Cavendish-road, West Didsbury. Specifications, etc., may be obtained at the offices of Messrs. Charles Clegg & Sons, architects, 21, Spring-gardens, Manchester, upon payment of 10*s.*

APRIL 12. — **Bath.** — BRIDGE WORKS. — For taking down and rebuilding retaining walls and general repairs at three bridges, for the Somerset C.C. Specifications, etc., may be obtained from Mr. H. T. Chapman, County Surveyor, Bath.

APRIL 14.—**Cairo, Egypt.**—PUMPING MACHINERY.—The Ministry of Public Works for the Egyptian Government invites tenders for the supply, etc., of a sewage pumping plant. Copies of the "Conditions of Tender" may be obtained gratis on application from Mr. A. L. Webb, C.M.G., Queen Anne's-chambers, Broadway, Westminster, London, S.W.

APRIL 16. — **Dover.** — ELECTRIC CRANE.—The Dover Harbour Board invite tenders for the construction upon rails provided upon the deck of a landing stage at Dover of an electric-worked jib crane. Printed forms of conditions of contract, etc., can be obtained upon application at office of Mr. Martyn Mowll, Register, Dover Harbour Board, Castle-street, Dover, on payment of 5*s.* for each copy.

APRIL 16.—**Rochdale.**—RESERVOIR.—The Corporation invite tenders for the construction of a covered service reservoir on land belonging to the Corporation, adjacent to Thornham New-road. The drawings may be seen, and a copy of the specification, etc., may be obtained, on payment of 5*l.* 5*s.*, at the offices of Messrs. H. Rofe & Son, civil engineers, 8, Victoria-street, Westminster, S.W., and Oxford-chambers, Victoria-square, Leeds.

APRIL 18.—**Madras.**—METERS, ETC.—The Corporation of Madras invite tenders for the supply, etc., of five Venturi meter installations, with diagram recorders, pump pressure and sewage level recorders, valves, hatch boxes, special pipe castings, etc. Full particulars, etc., can be obtained from Messrs James Mansergh & Sons, Agents to the Corporation, 5, Victoria-street, Westminster, S.W., on payment of 5*s.* per set, which will not be returned.

APRIL 23.—**Stroma.**—PIER WORKS.—The C.C. of Caithness invite tenders for the construction of additional works to be executed at Stroma South Pier. Copies of the plans, etc., may be seen at the office of Mr. James Young, County Clerk, County Clerk's Office, Thurso.

JUNE 16. — **Cairo.** — COMPRESSED AIR SYSTEM. — The Ministry of Public Works for the Egyptian Government invites tenders for the supply, etc., of installation for raising sewage by means of compressed air. Copies of the "Conditions of Tender" may be obtained free of charge on application from Mr. A. L. Webb, C.M.G., Queen Anne's-chambers, Broadway, Westminster, London, S.W.

NO DATE.—**Stanningley.**—EXCAVATING.—1,500 cubic yds. of excavation, for a large warehouse, at Leigh Mills, Stanningley. Names to Messrs. Thomas Barker & Son, architects, London and Midland Bank-chambers, Bradford.

MISCELLANEOUS.

APRIL 4. — **Edinburgh.** — FENCING.—The Corporation invite estimates for wrought-iron fencing and field gates along the north side of Slateford-road, at the Gorgie Estate. Schedules, etc., may be obtained on application to the City Road Surveyor, City Chambers.

APRIL 4. — **Newbridge.** — SCAVENGING.—The Newbridge Town Commissioners invite tenders for the cleaning of closets, etc., of Rowan-terrace, cleaning of Fair Green, Market Square, and closet at Town Hall, from April 1, 1910, to March 31, 1911. Mr. G. A. Searight, Town Clerk.

APRIL 5. — **Maldon.**—STEAM ROLLERS.—The R.D.C. invite tenders for the hire of steam rollers and scarifier for the year. Particulars, etc., can be obtained of Mr. Edgar J. Ennals, surveyor, 6, Market-hill, Maldon, Essex.

✱ APRIL 7. — **Burnley.** — TIMBER FENCING. — The Burnley Small Holdings Committee invite tenders for about 7,000 yds. of creosoted or other preserved timber fencing. See advertisement in this issue for further particulars.

✱ APRIL 7.—**Holloway.**—STEEL SASHES AND CASEMENTS.—The Commissioners of H.M. Works invite tenders for steel sashes and casements at the new Money Order Department Building, Holloway. See advertisement in this issue for further particulars.

APRIL 8.—**London.**—FILAMENT LAMPS.—The Commissioners of H.M. Works and Public Buildings invite tenders for the supply of metallic filament lamps of British manufacture. Forms of tender, etc., may be obtained on application to the Storekeeper, H.M. Office of Works, 12, Lambeth Palace-road, London, S.E.

APRIL 11.—**Finsbury.**—WATERING VANS.—The B.C. invite tenders for the supply of two street watering vans. Particulars, etc., may be had on application to the Cleansing Superintendent, at 26, Wharf-road, N.

APRIL 11.—**Hendon.**—FENCING.—Hendon U.D.C. invite tenders for the supply of about 370 yds. of certain wrought-iron unclimbable fencing. Specifications, etc., may be obtained on application to Mr. S. Slater Grimley, Engineer and Surveyor, Council Offices, The Burroughs, Hendon, N.W.

APRIL 12.—**Margate.**—CARTING.—Tenders are invited for excavating and carting away the chalk, earth, and other material at the Corporation's low service reservoir in rear of Milton-road. Further particulars can be obtained on application at the Borough Surveyor's Office, 13, Grosvenor-place, Margate.

✱ APRIL 31. — **Herne Bay.** — PIER EXTENSION WORKS.—The Herne Bay U.D.C. invite tenders for taking down and removing iron columns, girders, and other iron work and timber decking, which must be removed in connexion with the pier extension. See advertisement in this issue for further particulars

NO DATE.—**Derby.**—FURNISHING.—The Committee of the Derbyshire Hospital for Sick Children invite tenders for furnishing the new nurses' home. Particulars may be obtained from Mr. W. B. Delacombe, Secretary, 8, St. Mary's-gate, Derby.

PAINTING, etc.

APRIL 5. — **New Windsor.**—PAINTING.—The T.C. of the Borough of New Windsor invite tenders for painting works, etc., at the Police-station, St. Leonard's-road, Windsor. Specification may be seen, and form of tender obtained, upon application at the office of the Borough Surveyor, Alma-road, Windsor.

APRIL 6. — **Bargoed.** — PAINTING.—Painting and colouring the inside of the Cottage Homes, situate in Park-road, Bargoed, in accordance with the specification, which may be seen at the Homes, or at the Training School, Aberdare.

APRIL 9. — **Macclesfield.** — PAINTING.—The Parks Committee of the Corporation invite tenders for painting at the West and Victoria Parks. Specifications may be had on application to the Borough Surveyor.

APRIL 11. — **Eston.** — PAINTING, ETC.—Repainting and repairs to Congregational Church, Eston. Specifications, etc., at the church from 3.30 to 5.30 p.m. on the afternoons of April 4, 5, and 6.

APRIL 12.—**Great Western Railway.**—PAINTING, ETC.—The Directors of this company invite tenders for cleaning and repainting stations, etc. (ten contracts). Specifications may be seen, and forms of tender, etc., obtained, at the office of the Engineer at Shrewsbury Station for Contracts Nos. 9 to 11, at Wolverhampton Station for Contract No. 12, at Gloucester Station for Contracts Nos. 13 and 14, at Neath Station for Contract No. 15, and at Taunton Station for Contracts Nos. 16 to 19.

✱ APRIL 13. — **Dartford.** — PAINTING, ETC.—The Metropolitan Asylums Board invite tenders for cleaning, painting, and repairs at Gore Farm Convalescent Fever Hospital, near Dartford, Kent. See advertisement in this issue for further particulars.

APRIL 23. — **Ely, Cardiff.** — PAINTING. — The Guardians invite tenders for cleaning, colouring, and painting children's homes at headquarters, Ely, and in Cardiff and Penarth. Specification, etc., may be obtained from Mr. Arthur J. Harris, Clerk, Union Offices, Queen's-chambers, Cardiff.

NO DATE. — **Bridlington.** — PAINTING.—Painting, etc., of the whole of Messrs. Whitaker Bros., Ltd., property, also Messrs. the Hydro Company, Ltd., property, at Bridlington. Particulars, etc., can be obtained at the offices of the architect, Mr. H. Phillips, S.E., architect and civil engineer, 21, Scale-lane, Hull, and Chapel-street, Bridlington.

NO DATE.—**Hipperholme.**—PLUMBER'S WORK, ETC.—Plumber's and slater's work required for two villas at Hipperholme. Plans may be seen, and quantities obtained from Mr. Harry Smith, Architect and Surveyor, Holly Bank, Hipperholme.

ROADS, SANITARY, AND WATER WORKS.

APRIL 5. — **Caerphilly.** — SEWER. — Caerphilly U.D.C. invite tenders for construction of 12-in. sewer. Plan, etc., may be seen, and forms of tender obtained, on application at office of Mr. Alfred O. Harpur, Engineer and Surveyor, Caerphilly, upon depositing the sum of 1*l.* 1*s.*

APRIL 5.—**Ealing.**—PRIVATE STREET IMPROVEMENTS.—The T.C. invite tenders for the making-up of Creighton-road, Dorset-road (portion). The drawings, etc., may be seen, and forms of tender, etc., obtained, from Mr. Charles Jones, M.Inst.C.E., Borough Engineer, Town Hall, Ealing, W., upon payment of a deposit of 10*s.* 6*d.* for each road.

APRIL 5.—**Lewisham.**—KERBING, ARTIFICIAL STONE PAVING, ETC.—The B.C. invite tenders for kerbing, channelling, and metalling the roadways, and paving the footpaths with artificial stone (in separate contracts), of Ravensbourne Park, Catford. The plan, etc., may be seen, and forms of tender obtained.

ROADS, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

at the Town Hall, Catford (Surveyor's Department). Copies of the specification may also be had on payment of the sum of 5s. in each case, which will not be returned.

APRIL 5.—**Nuneaton.**—WATER MAINS.—For the labour only in excavating for and laying (not pipe-jointing) cast-iron pipes, etc., for the T.C. Plans may be seen, and copies of specification, etc., obtained, on application at the office of Mr. F. C. Cook, A.M.Inst.C.E., Borough Engineer, Municipal Offices, Nuneaton, and on deposit of 1*l.* 1s.

APRIL 5.—**Port Talbot.**—STREET IMPROVEMENTS.—The U.D.C. of Margam invite tenders for proposed street improvements at Margam-terrace, Port Talbot. Plans, etc., may be seen, and form of tender obtained, by appointment with the Surveyor to the Council, Mr. John Cox, Port Talbot, on payment of a deposit of 1*l.* 1s.

APRIL 5.—**Strathdearn.**—UPKEEP OF ROADS.—Tenders are invited by the Badenoch District Committee for the upkeep of roads and bridges in the following division for a period of three years:—Strathdearn, No. 2—extent, nineteen miles or thereby. Specifications, etc., may be had from Mr. John Mackenzie, Road Surveyor, County Buildings, Kingussie, on deposit of 10s.

APRIL 5.—**Teddington.**—MAKING-UP.—The U.D.C. of Teddington invite tenders for making-up of Cromwell-road and Sunnyside-road. Plans, etc., may be seen, and bills of quantities, etc., obtained, on payment of 2*l.* 2s., on application to Mr. M. Hainsworth, Surveyor, Council Offices, Teddington.

APRIL 6.—**Hafodyrynys.**—SEWERAGE.—Abertillery and Abercarn U.D. Councils invite tenders for the construction of sewers for the drainage of Hafodyrynys. Plans, etc., can be seen, and specifications, etc., obtained, on application to the Engineer, Mr. J. Williams, at his offices, Council Offices, Abercarn, Mon. on deposit of 1*l.* 1s.

✱ APRIL 6.—**London, S.W.**—ROAD REPAIRS, ETC.—The Metropolitan Asylums Board invite tenders for road repairing and tar paving works at the Western Fever Hospital, Fulham, S.W. See advertisement in this issue for further particulars.

APRIL 6-14.—**Newbiggin-by-the-Sea.**—WATER SUPPLY.—The U.D.C. invite tenders for water supply works. Specifications, etc., can be obtained, and plans can be seen, on application to Mr. R. Appleby, Surveyor, Council Offices, Newbiggin-by-the-Sea, on payment of 1*l.* 1s. deposit. Contractors wishing to be shown over the route are requested to meet at the Council Chamber on April 6 at 10 a.m. Previous notification to be sent of intention to be present.

APRIL 6.—**Pinxton.**—SEWER.—The Blackwell R.D.C. invite tenders for the reconstruction of a cast-iron sewer and all necessary works relating thereto, at Pinxton. Drawings may be seen, and specifications, etc., obtained, at the office of Mr. Henry Silcock, Surveyor to the Council, 67, Westgate, Mansfield, on payment of 1*l.*

APRIL 6.—**St. Austell (Cornwall).**—RESERVOIR.—For a reservoir near Penwithick, for the R.D.C. Drawings, etc., may be seen at the office of the engineer, Mr. H. S. Hancock, Sydney-place, St. Austell.

APRIL 6.—**Skelmanthorpe.**—BOWLING GREEN.—Construction of a bowling green at Skelmanthorpe for the Skelmanthorpe Central Bowling Club. Plans, etc., may be seen, and bills of quantities obtained, at office of Messrs. Brown & Shaw, architects, Dunford-road, Holmfirth.

APRIL 6.—**Thurnscoe.**—NEW FOOTPATHS.—The U.D.C. invite tenders for the flagging, surface draining, channelling, and kerbing of footpaths in Lidget-lane, Back-lane, Shepherd-lane, and High-street. Specification, etc., may be obtained from the Surveyor, at his office, High-street, Thurnscoe, upon a deposit of 1*l.* 1s.

APRIL 7.—**Hackney.**—ROAD-MAKING.—Hackney B.C. invite tenders for the kerbing, channelling, paving, making-up, etc., of Ravensdale-road (eastern portion). Specification, etc., may be inspected, and copies of the bill of quantities, etc., obtained, on application to Mr. Norman Scorgie, M.Inst.C.E., Borough Engineer and Surveyor, and on payment of the sum of 1*l.* 1s.

APRIL 9.—**East Bierley.**—SEWERAGE.—Hunsworth U.D.C. invite tenders for laying and jointing of 2,033 lin. yds. or thereabouts of earthenware pipe sewers, the construction of manholes, lampholes. Plans, etc., may be seen, and bills of quantities, etc., obtained, on application to the Council's Engineer, Mr. E. W. Ives, C.E., Elland-road, Gomersal, near Leeds, on payment of 2*l.* 2s.

APRIL 11.—**Diss.**—BOREHOLE.—Diss U.D.C. invite tenders for a trial borehole. Specifications may be obtained from the Engineer, Mr. W. H. Booth, Caxton House, Westminster, S.W., on payment of 2*l.* 2s.

APRIL 11.—**Kingsbridge (Devon).**—WATER MAIN.—For 950 lin. yds. of 4-in. and 1,300 lin. yds. of 3-in. water main, etc., for the U.D.C. Plans, etc., can be seen on application at the office of Mr. William Beer, Clerk, Fore-street, Kingsbridge.

✱ APRIL 11.—**Putney.**—MAKING-UP AND PAVING.—Wandsworth B.C. invite tenders for making-up and paving Heathview-gardens, Putney. See advertisement in this issue for further particulars.

APRIL 13.—**Birmingham.**—CONSTRUCTION OF FOUL AND SURFACE WATER SEWERS.—The Public Works Committee invite tenders for about two miles of 9-in. to 21-in. stoneware pipe sewers, 200 yds. of brick and concrete sewers, etc., Bordesley Green. The plans, etc., may be seen, and quantities, etc., obtained, at the office of Mr. Henry E. Stilgoe, City Engineer and Surveyor, the Council House, Birmingham, on deposit of the sum of 2*l.*

NO DATE.—**South Queensferry.**—TENNIS COURTS.—Offers wanted for laying down asphalt tennis and curling court at South Queensferry. Particulars may be obtained from Mr. A. S. P. Esson, Butlaw, South Queensferry.

STONES, MATERIAL, AND STORES.

APRIL 4.—**Oban.**—OIL.—The T.C. invite tenders for the supply of oil required at their generating station for a period of twelve months. Forms of tender may be obtained on application to Mr. Malcolm Sutherland, Burgh Electrical Engineer.

APRIL 4.—**Southampton.**—MATERIALS.—The Corporation invite tenders for the supply of (*a*) rails, (*b*) poles, (*c*) cast-iron pole bases, (*d*) granite setts, for tramway extensions. Specifications, etc., may be obtained of the General Manager at the Tramway Offices, Southampton.

APRIL 4.—**Stocksbridge.**—MATERIALS.—The Stocksbridge U.D.C. invite tenders for supply of materials. Particulars, etc., to be had from Mr. J. Marsden, Clerk to the Council, Council Offices, Stocksbridge.

APRIL 4.—**Teddington.**—ANNUAL CONTRACTS.—The U.D.C. invite tenders for the year for broken granite, flints, etc. Particulars, etc., may be obtained on application to Mr. Marshall Hainsworth, Surveyor, Council Offices, Teddington.

APRIL 5.—**Portslade-by-Sea.**—FLINTS.—The U.D.C. invite tenders for the supply of 150 yds. of clean hill flints and 500 yds. of screened dug flints. Forms of tender and further particulars can be obtained from the Surveyor, St. Andrew's-road, Portslade-by-Sea.

APRIL 5.—**Southampton.**—STORES, ETC., BOROUGH ENGINEER'S DEPARTMENT.—Specification, etc., may be obtained at the Borough Engineer's office.

APRIL 5.—**Swadlincote.**—MATERIALS.—The U.D.C. invite tenders for the supply of materials during the year. Specification, etc., may be obtained at the office of Mr. A. J. Mason, Town Engineer and Surveyor, Council Offices, Swadlincote.

APRIL 6.—**Bosmere.**—MATERIALS.—The R.D.C. of Bosmere and Claydon invite tenders for granite, picked stones, pit stones. Particulars and forms of tender on application to Mr. George Fiske, surveyor, Red House, Coddenham, Ipswich.

APRIL 6.—**Devonport.**—MATERIALS.—The Water Committee of the Devonport Corporation invite tenders for supplying ironwork, sluice valves, hydrants, bib taps, etc. Particulars, etc., may be obtained from Mr. F. W. Lillicrap, Water Engineer, Municipal Offices, Devonport.

APRIL 6.—**Lydd.**—ROAD MATERIAL.—The T.C. invite tenders for the supply and delivery of materials. No tender form supplied. Mr. Thomas Kettle, Borough Surveyor, Lydd.

APRIL 6.—**Radstock.**—ROAD MATERIALS, ETC.—The U.D.C. invite tenders for the supply of about 900 tons of basalt, about 100 tons of basalt gravel, and for other material. Forms of tender may be obtained from the Council's Surveyor, Mr. Geo. H. Gibson, Radstock, Bath.

APRIL 6.—**Romney Marsh.**—MATERIALS.—The R.D.C. require materials. The District Surveyor will attend at the Ship Hotel, New Romney, April 6, at 10 a.m., for the purpose of contracting for supply and delivery.

APRIL 6.—**Southwark.**—JARRAH WOOD BLOCKS.—The B.C. invite tenders for the supply of Jarrah wood blocks. Further particulars, etc., may be obtained at the office of the Borough Engineer, Town Hall, Walworth-road, S.E.

APRIL 6.—**Stroud.**—STONE.—The R.D.C. invite tenders for the supply of 2-in. broken road stone. Mr. J. E. Haynes, Surveyor, Union Offices, Stroud.

APRIL 7.—**Bradford.**—REQUISITES.—The Corporation invite tenders for the supply of requisites for the parks and cemeteries departments for the ensuing year. Forms of tender, etc., may be obtained at the Town Clerk's Office.

APRIL 7.—**Peterborough.**—MATERIALS.—The City Council invite tenders for the supply of broken granite, granite kerb and channelling, etc., and Portland cement for the year. Specifications, etc., may be obtained at office of Mr. J. W. Walshaw, City Surveyor, Guildhall, Peterborough.

APRIL 11.—**Faversham.**—GRANITE.—The R.D.C. invite tenders for the supply and delivery of 1,060 tons of best Guernsey granite. Form of tender and further particulars can be had on application to the District Surveyor, Mr. J. G. Chittenden, Ashford-road, Faversham.

APRIL 11.—**Govan.**—PLUMBERS' MATERIALS, ETC.—Govan Combination P.C. and Govan District Lunacy Board invite offers for the supply of materials for twelve months. Forms of tender, etc., may be obtained on application to Mr. John Mitchell, Inspector and Clerk, 7-8, Carlton-place, Glasgow.

APRIL 11.—**Kingston.**—TIMBER.—The Guardians of the Kingston Union invite tenders for the supply of 120 fathoms of best Swedish board ends at the Norbiton Common Farm, Kingston-road, New Malden. Mr. Chas. W. Dash, Clerk to the Guardians, Union Offices, Coombe-road, Kingston-on-Thames.

APRIL 11.—**West Suffolk.**—GRANITE.—The C.C. invite tenders for the supply of granite for the main roads. Specification and form of tender can be obtained on application to Mr. A. Ainsworth Hunt, County Surveyor, Shire Hall, Bury St. Edmund's.

APRIL 12.—**Leith.**—MATERIALS.—Leith Harbour and Docks Commissioners invite tenders for the supply of timber, iron, and stores. Particulars may be obtained on application at the office of the Superintendent, Tower-place, Leith.

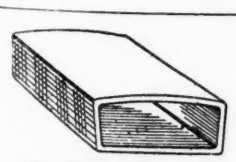
✱ APRIL 13.—**London, S.W.**—YORK PAVING.—The Chelsea B.C. invite tenders for supply of York paving. See advertisement in this issue for further particulars.

Auction Sales.

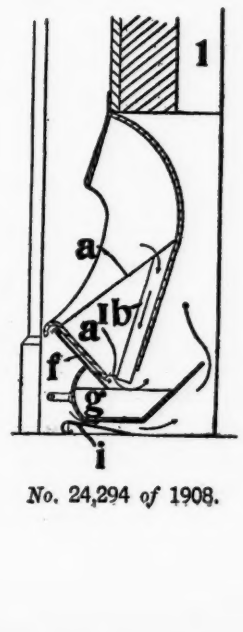
Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, BOARDS, TIMBER, ETC.—Great Hall, Winchester House, E.C.	Churchill & Sim	April 13
*TWO HOUSES AND ANNEXE, WANDSWORTH COMMON, S.W.—At the Mart	Douglas Young & Co.	April 13
*FREEHOLD PROPERTY, THAMES DITTON—At the Mart	Driver, Jonas, & Co.	April 19
*FREEHOLD ESTATE, PALMER'S GREEN, N.—At the Mart	Driver, Jonas, & Co.	April 19
*MACHINERY, PLANT, STOCK, ETC., WESTMINSTER BDGE.-RD., S.E.—On the Premises	Fuller, Horsey, Sons, & Cassell	April 20

PATENTS.—*Continued from page* 390.

24,056 of 1908.—Joseph Burgess: Bricks. This relates to hollow earthenware tiles used in the construction of fireproof floors and for building, and consists in externally scoring or roughening the sides and bottom and, if necessary, the top of the tile before firing, so as to form a hard keying surface to which concrete, cement, or plaster will readily adhere. A number of the tiles may be built end to end in a floor so as to form an air shaft, which may be used for ventilating the structure.



No. 24,056 *of* 1908.

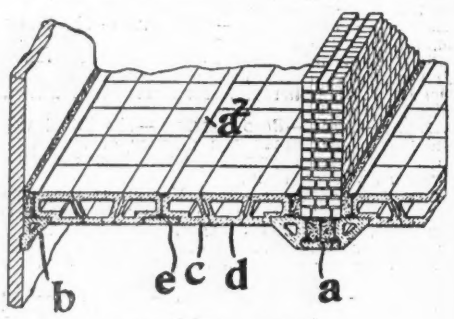


No. 24,294 *of* 1908.

24,294 of 1908.—Lionel Charles Lutyens and Walter Fowler: Fireplaces. This relates to an open fireplace of the down-draught type, which has a wedge-shaped fuel-holder *a* with an upper end, and, at its lower end, a narrow opening a^1, through which the combustion products pass to the chimney *l*. The fuel-holder *a* has a ribbed or fluted back *b* and air-supply channels *f* at its front and sides. The draught is regulated by means of a wedge-shaped body *i*, which is adjusted beneath a plate supporting the ashpan *g*.

25,206 of 1908.—Albert Carl: Ceilings. This relates to ceilings, which are constructed of side blocks *c*, voussoirs, or wedge-shaped blocks *d*, cornice blocks *b*, and covering slabs *e*. The side blocks *c* are so shaped on one side as to engage with and be supported by the girders a^2, and are provided on the other side with wedge-shaped surfaces, between which the voussoirs *d* lift. The blocks *c*, *d* extend below the girders, and the blocks *c* are formed with dovetailed recesses on their lower surfaces for supporting the cornice blocks *b* and covering slabs *e*, concealing the lower surfaces of the

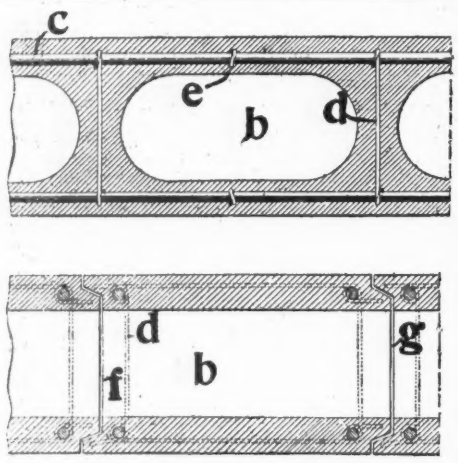
girders. In the case of floors in which girders are arranged to support a partition wall which does not extend below the floor modified



No. 25,206 *of* 1908.

cornice blocks are used which are shaped to engage with the girders, and are provided with recesses to support covering slabs.

25,374 of 1908.—Guillaume Dujardin: Concrete beams. This relates to a concrete beam of rectangular section reinforced by means of four rods *c* placed near the longitudinal edges and connected by horizontal ties *e*. Lateral



No. 25,374 *of* 1908.

openings *b* are made through the beam, leaving cross-ribs which contain vertical ties *d* connecting the top and bottom bars. The beams are laid side by side, and interlock by means of projections *g* and depressions *f*.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 12.—By BRUTON, KNOWLES, & Co. (at Gloucester).

Arlingham, Glos.—Puckpool Farm, 111 a. 2 r. 4 p., f.	£3,450

March 15.—By RICHARDSON & TROTTER (at York).

Easingwold, Yorks.—Fawdington Lodge Farm, 311 a. 3 r. 17 p., f.	5,775

By ARTHUR RUTTER, SONS, & Co. (at Cambridge).

Cambridge.—5 to 8, Bateman-st., u.t. 53 yrs., g.r. 8*l.* 16s., y.r. 100*l.*	1,310
25, 26, 27, 30, and 31, Bateman-st., u.t. 53 yrs., g.r. 8*l.* 7s. 3d., y.r. 155*l.*	1,620
32, Bateman-st., f., y.r. 19*l.*	480

March 17.—By FURBER (at Hemel Hempstead).

Hemel Hempstead, Herts.—Albion-Hill, Fareham House, f., e.r. 45*l.*	605
Albion Cottage, f., w.r. 18*l.* 12s. 8d.	210
1 and 2, Albion-villas, f., y.r. 44*l.*	500
1 to 8, Albion-ter., f., w.r. 79*l.* 12s. 6d.	815
Boxmoor, Herts.—85, St. John's-rd. (s), f., y.r. 25*l.*	350
65 to 71 (odd), Horsecroft-rd., f., w.r. 50*l.* 1s.	475
Apsley End, Herts.—Storey-st., The Limes, f., w.r. 36*l.* 16s.	335
Constance-villas (three), f., w.r. 54*l.* 12s.	480
Weymouth-st., Stanley Villa, f., p.	270
King's Langley, Herts.—The Drapery Stores, f., p.	425
House and shop, f., y.r. 30*l.*	450

March 18.—By HARRY BALL (at Bedford).

Bedford.—14 to 26 (even), Bedesmans-pl., f., y.r. 81*l.* 18s.	1,113
11 and 13, Denmark-st., f., y.r. 32*l.* 10s.	500
85, 89 and 91, Gladstone-st., f., y.r. 40*l.* 10s.	648
21 and 23, Westbourne-rd., f., e.r. 26*l.* 8s.	300

By ERNEST S. BEARD & DANIELL (at Sudbury).

Sudbury, Suffolk.—Harpclose House, f., w.r. 1*l.* 8s.	158
44, 45, and 47, Cross-st., f., w.r. 25*l.* 7s.	303
1 to 5, Plough-la., f., w.r. 39*l.* 4s. 4d.	260
March 19.—By BEARD & DANIELL (at Colchester).	
Abberton, Essex.—Abberton Grange Farm, 97 a. 3 r. 34 p., f.	£3,300
March 21.—By GODDARD & SMITH.	
Hornsey-lane.—No. 96, f., y.r. 100*l.*	800
Highgate.—Shepherd's Hill, Highcroft, u.t. 69 yrs., g.r. 22*l.*, y.r. 145*l.*	1,375
By LOCKING, COULSON, & WALKER.	
Stoke Newington.—126, Manor-rd., u.t. 64 yrs., g.r. 11*l.*, e.r. 70*l.*	725
By STEPHENSON & ALEXANDER (at Cardiff).	
Cardiff.—49, St. Mary-st., area 350 yds., f., y.r. 150*l.*	2,800
2 to 8 (even), Brunel-st., u.t. 71 yrs., g.r. 12*l.*, w.r. 83*l.* 4s.	510
March 22.—By DEBENHAM, TEWSON, RICHARDSON, & Co.	
Old Ford.—221 and 223, Old Ford-rd., f., w.r. 72*l.* 16s.	495
By WOOTTON & SON.	
Basildon, Essex.—Oakmead, two cottages and 3 a., f.	400
March 23.—By DYER, SON, & HILTON.	
Lee.—2, Marlborough-rd., u.t. 42½ yrs., g.r. 6*l.*, p.	260
Blackheath.—The Glebe, Balholm, u.t. 20½ yrs., g.r. 6*l.* 10s., p.	215
By WALTER HALL & SONS.	
Bromley-by-Bow.—20, Empson-st., u.t. 26 yrs., g.r. 5*l.*, p.	280
Fulham.—4, Lalor-st., u.t. 75 yrs., g.r. 6*l.* 10s., y.r. 34*l.*	285
Barnsbury.—23 and 24, Clayton-st., u.t. 34½ yrs., g.r. 12*l.*, y. and e.r. 60*l.*	250
By MARLER & MARLER.	
Chelsea.—15, Edith-gr., u.t. 43¼ yrs., g.r. 8*l.*, y.r. 50*l.*	380
37, Lamont-rd., u.t. 57¼ yrs., g.r. 6*l.*, y.r. 40*l.*	380
By NICHOLAS.	
Pimlico.—16, Denbigh-st., u.t. 20¼ yrs., g.r. 8*l.*, y.r. 60*l.*	340
By HERBERT J. NORMAN.	
Southall.—46, High-st. (s.), f., y.r. 55*l.*	1,060

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.

	£	s.	d.
Best Stocks	1	8	0

Per 1000, Delivered at Railway Depôt.

	£	s.	d.		£	s.	d.
Picked Stocks for Facings	2	10	0	D'ble Stretchers	16	7	6
Flettons	1	6	0	Double Headers	13	7	6
Best Fareham Red	3	12	0	One Side and two Ends	17	7	6
Best Red Pressed Ruabon Facing	5	0	0	Two Sides and one End	18	7	6
Best Blue Pressed Staffordshire	3	15	0	Splays & Squints	15	17	6
Do. Bullnose	4	0	0	Best Dipped Salt Glzd Str'tch'rs	10	17	6
Best Stourbridge Fire Bricks	3	14	0	Headers	10	7	6
GLAZED BRICKS.				Quoins, Bullnose, and Flats	14	7	6
Best White and Ivory Glazed Stretchers	10	17	6	D'ble Stretchers	16	7	6
Headers	10	7	6	Double Headers	13	7	6
Quoins, Bullnose, and Flats	14	7	6	One Side and two Ends	17	7	6
				Two Sides and one End	18	7	6
				Splays & Squints	15	17	6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s.	d.	
Thames and Pit Sand	6	6	per yard delivered.
Thames Ballast	5	0	,, ,,
Best Portland Cement	28	0	per ton, ,,
Best Ground Blue Lias Lime	19	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

Per Ft. Cube.

	s.	d.
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½

Per Ft. Cube, Delivered at Railway Depôt.

	s.	d.		s.	d.
Ancaster in blocks	1	10	Red Corsehill in blocks	2	2
Beer in blocks	1	6	Closeburn Red Freestone	2	0
Greenshill in blocks	1	10	Red Mansfield Freestone	2	4
Darley Dale in blocks	2	4			

STONE (*continued*).

YORK STONE—*Robin Hood Quality.*

	s.	d.
Scappled random blocks	2	10

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3
6 in. rubbed two sides ditto, ditto	2	6
3 in. sawn two sides slabs (random sizes)	0	11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½
1½ in. to 2 in. ditto, ditto	0	6

Per Ft. Cube, Delivered at Railway Depôt.

Scappled random blocks	3	0

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto	3	0
3 in. sawn two sides slabs (random sizes)	1	2
2 in. self-faced random flags	0	5

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£	s.	d.	In. In.	£	s.	d.
20×10 best blue Bangor	13	2	6	20×10 best Eur'ka unfading green	15	17	6
20×12 ditto	13	17	6	20×12 ditto	18	7	6
20×10 1st quality ditto	13	0	0	18×10 ditto	13	5	0
20×12 ditto	13	15	0	16×8 ditto	10	5	0
16×8 ditto	7	5	0	20×10 permanent green	11	12	6
22×10 best blue Portmadoc	12	12	6	18×10 ditto	9	12	6
16×8 ditto	6	12	6	16×8 ditto	6	12	6

TILES.

At Railway Depôt.

	s.	d.		s.	d.
Best plain red roofing (per 1000)	42	0	Best "Rosemary" brand plain (per 100)	48	0
Hip and Valley per doz.)	3	7	Best Ornamental (per 1000)	50	0
Best Broseley (per 1000)	50	0	Hip (per doz.)	4	0
Do. Ornamental (per 1000)	52	6	Valley (per doz.)	3	8
Hip and Valley (per doz)	4	0	Best "Hartshill" brand, plain sand-faced (per 100)	50	0
Best Ruabon red, brown, or brindled (Edw'd's) (per 1000)	57	6	Do. pressed (per 1000)	47	6
Do. Ornamental (per 1000)	60	0	Do. Ornamental (per 1000)	50	0
Hip (per doz.)	4	0	Hip (per doz)	4	0
Valley (per doz.)	3	0	Valley (per doz.)	3	6
Best Red or Mottled Staffordshire do. (Peakes) (per 1000)	51	9	Staffords. (Hanley) Reds or Brindled (per 1000)	42	6
Do. Ornamental do. (per 1000)	54	6	Hand-made sand-faced (per 1000)	45	0
Hip (per doz.)	4	1	Hip (per doz.)	4	0
Valley (per doz.	3	8	Valley (per doz.)	3	6

WOOD.

BUILDING WOOD.	At per standard.					
	£	s.	d.		£	s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	0	0	...	15	10 0
Deals: best 3 by 9	13	10	0	...	14	10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	...	12	10 0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	" "		
2 in. by 4 in. and 2 in. by 6 in.	9	10	0	...	10	10 0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	...	10	0 0
Foreign Sawn Boards—						
1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	"		

	At per load of 50 ft.					
	£	s.	d.		£	s. d.
Fir timber: best middling Danzig or Memel (average specification)	5	0	0	...	5	10 0
Seconds	4	10	0	...	5	0 0
Small timber (8 in. to 10 in.)	3	17	6	...	4	0 0
Small timber (6 in. to 8 in.)	3	5	0	...	3	10 0
Swedish balks	2	12	6	...	3	0 0
Pitch-pine timber (30 ft. average)	4	10	0	...	5	5 0

JOINERS' WOOD.	At per standard.					
	£	s.	d.		£	s. d.
White Sea: first yellow deals, 3 in. by 11 in.	24	10	0	...	25	10 0
3 in. by 9 in.	22	10	0	...	23	10 0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	...	18	0 0
Second yellow deals, 3 in. by 11 in.	19	0	0	...	20	0 0
" " 3 in. by 9 in.	18	0	0	...	19	10 0
Battens, 2½ in. and 3 in. by 7 in.	14	0	0	...	15	0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14	0	0	...	15	0 0
Battens, 2½ in. and 3 in by 7 in.	1	10	0	...	12	10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21	10	0	...	22	10 0
Do. 3 in. by 9 in.	18	10	0	...	19	10 0
Battens	14	0	0	...	15	0 0
Second yellow deals, 3 in. by 11 in.	16	10	0	...	17	10 0
Do. 3 in. by 9 in.	15	0	0	...	16	0 0
Battens	11	10	0	...	12	10 0
Third yellow deals, 3 in. by 11 in.	13	10	0	...	14	10 0
Do. 3 in. by 9 in.	13	0	0	...	14	0 0
Battens	10	10	0	...	11	0 0
White Sea and Petersburg—						
First white deals, 3 in. by 11 in.	15	0	0	...	16	0 0
" " 3 in. by 9 in.	14	0	0	...	14	10 0
Battens	11	10	0	...	12	10 0
Second white deals, 3 in. by 11 in.	14	0	0	...	15	0 0
" " 3 in. by 9 in.	13	0	0	...	14	0 0
Battens	10	10	0	...	11	0
Pitch-pine: deals	19	0	0	...	21	0
Under 2 in. thick extra	0	10	0	...	1	0
Yellow pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	"		
Seconds, regular sizes	33	0	0	"		
Oddments	28	0	0	"		
Kauri Pine—Planks, per ft. cube	0	3	6	...	0	5 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	£ s. d.	£ s. d.
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 3 0	0 3 9
Small " "	0 2 6	0 2 6
Wainscot Oak Logs, per ft. cube..	0 5 6	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	0 0 9½
¾ in. do. do	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch...	0 0 10	0 1 1
Selected, Figury, per ft. super as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. super as inch	0 0 10	0 1 0
Teak, per load	18 0 0	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 0
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. " "	0 14 0	0 18 0
¾ in. by 7 in. white " "	0 10 0	0 11 6
1 in. by 7 in. " "	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.	
Rolled Steel Joists, ordinary sections	£ s. d. 7 0 0	£ s. d. 7 10 0
Compound Girders, ordinary sections	9 0 0	10 0 0
Steel Compound Stanchions	11 0 0	12 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	10 0 0
Flitch Plates	9 0 0	9 10 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	8 10 0

METALS.

	Per ton, in London.	
IRON—	£ s. d.	£ s. d.
Common Bars	8 10 0	9 0 0
Staffordshire Crown Bars, good merchant quality	8 15 0	9 5 0
Staffordshire "Marked Bars"	10 10 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
" " Galvanised	17 0 0	—
(*And upwards, according to size and gauge.)		
Sheet Iron Black—		
Ordinary sizes to 20 g.	9 15 0	—
" " 24 g.	10 15 0	—
" " 26 g.	12 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 0 0	—
Ordinary sizes to 22 g. and 24 g.	15 10 0	—
" 26 g.	16 10 0	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	18 0 0	—
" " 22 g. and 24 g.	18 10 0	—
" " 26 g.	20 0 0	—
alvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	14 10 0	—
" " 22 g. and 24 g.	14 15 0	—
" " 26 g.	16 5 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12 0 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	—
" " " 26 g.	15 0 0	—
Cut Nails, 3 in. to 6 in.	10 10 0	11 0 0
(Under 3 in., usual trade extras.)		

LEAD, &c.	Per ton, in London.	
	£ s. d.	
LEAD—Sheet, English, 4lb. and up.	16 12 6	—
Pipe in coils	17 2 6	—
Soil pipe	20 2 6	—
Compo pipe	20 2 6	—
ZINC—Sheet—	In casks of 10 cwt.	
Vielle Montagne	28 12 6	—
Silesian	28 5 0	—
Zinc, in bundles, 1s. per cwt. extra.		
COPPER—		
Strong Sheet per lb.	0 1 0	—
Thin "	0 1 1	—
Copper nails	0 0 10	—
Copper wire	0 0 10	—
BRASS—		
Strong Sheet	0 0 11	—
Thin	0 1 0	—
TIN—English Ingots	0 1 5	—
SOLDER—Plumbers'	0 0 7	—
Tinmen's	0 0 9	—
Blowpipe	0 1 0	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

Per Ft., Delivered.

15 oz. thirds	2½d.	26 oz. fourths	3d.
" fourths	1½d.	32 oz. thirds	5d.
21 oz. thirds	3d.	" fourths	4½d.
" fourths	2½d.	Fluted Sheet, 15 oz.	3½d.
26 oz. thirds	4d.	" 21 oz.	4½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

Per Ft., Delivered.

Hartley's	2½d.	Figured, Oxford	
"	2½d.	Rolled, & 'Oceanic'	
"	2½d.	Glass, white	3½d.
		Ditto, tinted	5d.

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 3 1
" " " in barrels	"	0 3 2
" " " in drums	"	0 3 5
Boiled " " in barrels	"	0 3 5
" " " in drums	"	0 3 8
Turpentine in barrels	"	0 3 6
" in drums	"	0 3 8
Genuine Ground English White Lead	per ton	20 10 0
Red Lead, Dry	"	20 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 0
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 10 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 9
French and Brush Polish	0 10 6

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ALTHORPE and KEADBY.—For additions to Council school, for Lindsey County Council Education Committee. Messrs. Scorer & Gamble, Architects, Bank-street-chambers, Lincoln:—

H. J. Thompson	£1,183 0 0	Hollingsworth	£1,076 10 10
A. J. Elmes	1,168 10 3	Stacey	1,072 10 6
F. Scarborough	1,144 1 0	Moody Bros.	1,060 16 0
Wright & Son	1,137 0 0	B. Pumfrey	1,060 0 0
G. F. Waite	1,114 0 10	Teanby, Althorpe, near Doncaster *	1,057 10 0

BARNOLDSWICK (Yorks).—For widening portions of Gisburn and Skipton roads, etc., for the Urban District Council. Mr. W. Bennett, Engineer and Surveyor, Town Hall, Barnoldswick:—

Widening Dam Head Bridge.

W. J. J. Macdonald	£416 19 6
R. Naylor & Son	394 3 4
Clegg Bros.	372 8 7
F. Atkinson & Co.	371 8 6
Ward & Tetley	385 12 10
Muff & Randell, Barnoldswick*	324 11 7

Skipton and Gisburn road Improvements.

R. Naylor & Son	£134 15 3
Ward & Tetley	118 19 7
W. J. J. Macdonald	113 10 3
Clegg Bros.	112 11 5
Muff & Randell, Barnoldswick*	98 5 6

BARRY.—For alterations and additions to Holton-road Infants' School, for Barry Local Education Authority. Mr. G. A. Birkenhead, architect, 102, St. Mary-street, Cardiff, and St. Nicholas-road, Barry:—

W. H. Evans	£1 875 0 0
D. Davies & Sons	1,750 0 0
H. Fisher	1,584 15 0
Gibby & Cleak	1,571 15 0
D. W. Davies & Howell	1,565 0 0
Lloyd & Tape	1,561 8 5
Vickery Bros.	1,506 7 5
E. D. W. Evans	1,460 0 0
Price Bros.	1,437 0 0
H. S. Rendell	1,381 9 4
W. A. Jones, 39, Maesycwm-street, Barry*	1,316 14 6½

For Plumbing Work.

E. Perman	£247 7 7
E. H. Newman	246 8 3
D Davies & Sons	230 0 0
H. Fisher	227 15 0
H. S Rendell	220 6 11
G. Radcliffe	210 4 1
Vickery Bros.	209 15 8
D. W. Davies & Howell	200 0 0
Gibby & Cleak	199 16 7
W. H. Allen	186 12 3
H. R. Paul & Son	184 19 2
G. Motton, Court-road, Barry*	170 14 2
Price Bros.	165 0 0

BELLINGHAM.—For erecting masonry abutments and wing walls in connexion with reconstruction of Longlee Bridge, over the Warks Burn, near Longlee, for the Rural District Council. Mr. R. E Riddle, Surveyor, Percy-terrace, Bellingham. Quantities by Surveyor:—

J. Patterson	£174 7 0	E. Henderson & Son, Ponteland*	£153 9 6
A. W. Charlton	173 0 0		
W. Welton	163 1 6		

BRAICHYCYMMER (Glam.).—For the erection of additions to the Council school, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

F. W. Lougher & Co., Pontycymmer*.. £529 14 2

BUCKFASTLEIGH (Devon).—For laying water mains, etc., for the Urban District Council. Mr. A. Warren, Surveyor to Urban District Council:—

C. Willcocks, Buckfastleigh* £142 17 3

CAMBRIDGE.—For additions and alterations to the porter's lodge at the Workhouse, Mill-road, for the Guardians. Mr. Sidney French, architect. Quantities by architect:—

H. E. Ambrose	£196 5 0	J. Brignell	£145 0 0
G. B. Mortlock	170 3 0	Kidman Bros.	139 15 0
N. Pamphilon & Son	156 3 3	Clark & Sons*	139 0 0
		H. Rooke	132 0 0

[All of Cambridge.]

CHESTER.—For alterations and additions to a public elementary school in Victoria-road, for the Borough Council. Mr. P. H. Lockwood, architect, St. Werburgh-street, Chester:—

T. Mayers, Rowton, Chester* £3,135

CHURCH.—For sewering and paving works, Parsonage-street, for the Urban District Council. Mr. W. E. Wood, Surveyor, District Council Offices, Church:—

T. Brown, Oswaldtwistle* ....as per schedule.

CWMLAI TONYREFAIL (Glam.).—For the erection and completion of a new Council school at Cwmlai Tonyrefail, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

F. Bond, Beda-road, Cardiff‡ £5,292 17 4

‡ Recommended for acceptance.

EALING.—For the erection of new school buildings in connexion with Haven Green Baptist Church. Messrs. Geo. Ashby, Lean, & Son, architects and surveyors, 491, Oxford-street, W.:—

	Estimate A.	Estimate B.	Deduction.
Myring & Son	£2,450 0	£1,200	£30
C. Ansell	2,340 0	1,180	40
Frost & Co.	2,167 15	1,064	—
G. Bollom	2,133 0	1,076	29
W. Thorn	2,112 0	1,205	75
W. J. Dickens	*2,070 0	1,030	32

EARSDON.—For making good certain streets, Holywell, for the Urban District Council. Mr. J. R. MacMillen, Surveyor, Council Offices, Shiremoor:—

J. Bunsh	£438 2 4	J. McLaren, Gosforth*	£332 16 4
J. Coxon	428 4 4		
M. D. Young	353 17 10		

FAREHAM (Hants).—For re-erecting a hospital block at Isolation Hospital, for the Rural District Council. Mr. Wilberforce Cobbett, architect, Fareham. Quantities by architect:—

J. Croad, Gosport* £667

FINCHLEY.—For redecoration of the Finchley County school, for the Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee:—

A. Ibbetson	£397 14 6	Batchelor & Sons*	£298 0 0
E. E. & A. Tee	324 10 0		
Hall & Son	324 0 0		

HAMMERSMITH.—For cleaning, painting, etc., at Ravenscourt Park Library, for the Borough Council. Mr. H. Mair, Borough Surveyor, Town Hall, Hammersmith:—

A. Perton	£411 11 6	C. F. Clayton	£197 18 0
J. R. Myring	324 6 6	F. Bull	192 0 0
Lundy, Gasson, & Co.	259 10 0	J. Burns & Co.	178 10 0
Wrack & Co.	249 18 6	P. McCarthy	158 0 0
W. Chapman & Sons	246 9 0	S. Squire	147 0 0
Lee & Easty	246 4 0	Woollaston Bros.	144 0 0
Leighton Boyce	240 0 0	R. Woollaston & Co.	140 0 0
Finch & Co.	218 18 0	J. Moseley, Queen's Park, N.W.*	118 17 6
J. Strong & Co.	218 0 0		
W. R. & A. Hide	217 8 0		

HARRINGTON (Cumberland).—For laying out cemetery ground and erecting a boundary wall, cemetery chapel, and curator's house at West Ghyll-end, High Harrington, for the Urban District Council. Mr. C. W. Eaglesfield, architect and surveyor, Gordon-street, Workington:—

Builders and Joiners: L. Ferguson & Sons, Harrington*	£1,494 6 11
Slaters: T. Mandle & Co., Maryport*	95 10 0
Plasterer: J. C. Perrin, Workington*	56 0 0
Plumbers: Pape & Co., Workington*	43 0 0
Painter and Glazier: H. Sanderson, Workington*	40 0 0

LLANDRINDOD WELLS.—For erecting a new villa for Dr. R. Ackerley. Messrs. Alfred Swash & Son, architects, "The Mount," Llandrindod Wells. Quantities by architects:—

Turford & Southward, Gravel-hill, Ludlow* .. £2,270

[Nine tenders received.]

LLEST PONTYRHYL (Glam.).—For the erection and completion of a new Council school at Llest Pontyrhyl, Glam., for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

F. W. Lougher & Co., Pontycymmer* .. £3,177 10

NEWBRIDGE (Mon.).—For erecting a new church, for the Trustees of the Zoar Welsh Congregational Church. Mr. J. W. Aldiss, M.S.A., architect and surveyor, Newbridge, Mon.:—

T. F. Howells	£1,775 3 3	E. F. King & Co.	£1,438 0 0
W. J. Bloxham	1,742 0 0	C. H. Reed	1,395 0 0
W. Williams	1,654 0 0	J. Jenkins & Co., Ltd	1 389 0 0
D. Davies & Sons	1,650 0 0	E. W. D. Evans	1,380 0 0
J. T. Jones	1,575 0 0	C. F. Morgan	1,360 0 0
A. S. Morgan & Co.	1,500 0 0	Gregory Bros.	1,320 0 0
Price Bros.	1,498 0 0	A. & J. Richards	1,272 0 0
W. Jones	1,495 0 0	Jones & Jones	1,177 15 5
G. F. Leadbeter	1,486 0 0	S. Edwards, Newbridge*	1,137 17 0

NORWICH.—For painting (externally) various provided schools, for the Education Committee. Mr. C. J. Brown, architect and surveyor, Cathedral Offices, The Close, Norwich:—

		Schools.
I. W. King, Grove-road, Norwich	£39 0	.. 1
A. Taylor, Norwich	10 0	.. 2
J. W. Read & Son, 6, Pottergate-street, Norwich	29 14	.. 1
E. J. Fisher, Peacock-street, Norwich	45 10	.. 4
A. Burrell, Unthank-road, Norwich	44 0	.. 1
G. Marshall, Heath-road, Norwich	51 0	.. 1
T. Horth & Son, Magdalen-street, Norwich	64 0	.. 2

PITTENWEEM (Scotland).—For extension of Ovenstone Hospital, for St. Andrews District Committee Fife County Council. Mr. Henry, architect, St. Andrews, Scotland. Quantities by architect:—

Plumbers: Gray & Pringle, Anstruther*	£368 8 0
Mason and Bricklayer: A. Knowles, Anstruther*	305 3 2
Joiners: W. Wheeler & Son, Pittenweem*	174 9 6
Plasterer and Tiler: R. Williamson, Pittenweem*	124 6 7
Slater: W. Greig, St. Andrews*	78 15 4
Asphalt Work: W. Briggs & Son, Dundee*	22 7 1

PLYMOUTH.—For the erection of a store at the Victoria Wharves, Cattedown. Mr. W. F. Tollit, architect, Totnes:—

A. N. Coles	£581	Toyer & Sons	£429
Petheck Bros.	544	W. G. Hosken, Compton, Plymouth*	372
Moore & Sons	490		

PONTYPRIDD (Glam.).—For the erection and completion of latrines for boys at the Pontypridd County school, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—
T. F. Howells, Caerphilly* £285 10

PONTYPRIDD (Glam.).—For the alteration of the laboratory block at the Pontypridd County school, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—
T. F. Howells, Caerphilly* £230

PRENTON.—For constructing Acrefield-road, Prenton, for Wirral Rural District Council. Mr. Saml. Davies, Surveyor, Heswall. Quantities by Surveyor:—

F. Hayes	£511 0 0	J. Thomas & Sons	£329 0 0
L. Woodland & Co.	450 18 0	C. L. Warren	318 0 4
F. Ireland	365 0 1	R. Hughes	310 0 0
W. F. Chadwick, Ltd.	353 10 0	A. Harris, Frankby, Birkenhead*	289 16 0

SETTLE.—For extension of water mains, Clapham-cum-Newby and Austwick, for the Rural District Council. Mr. T. A. Foxcroft, Surveyor, Town Hall, Settle:—

F. Atkinson & Co.	£863 8 0	Brassington Bros. & Corney	£511 10 10
Hannay Bros.	617 7 6	Newsholme & Winder	496 19 5
S. Waterhouse	598 19 0½	C. M. Slinger	471 13 11
Bennie & Thompson	589 19 2	W. Pritchard, Austwick*	433 7 9
W. Stocks	557 15 1	H. Spencer	427 13 3
W. Hayton	540 11 11		

SHEFFIELD.—For erecting a new infants department for 468 places at Owlerlane Council school, for the Education Committee:—
W. R. Unwin, Ecclesfield £7,806 3

SLOUGH.—For alterations to shops No. 144, High-street, Slough, and converting premises at rear of same into a cinematograph theatre, for the Theatres Contract and Finance Company, Ltd. Messrs. Moscrop-Young & Glanfield, architects:—

Building Contract.

J. Pitcher & Son	£1,028 0	H. D. Bowyer†	£942 0
H. Street	981 0	J. Deverill	939 10
J. Goddard & Son	950 0		

Steelwork.

G. Aston & Sons	£121 10
British Challenge Glazing Co.	82 7
D. Rowell & Co.†	70 15

SOUTHALL.—For redecoration of the Southall County school, for the Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee:—

A. & B. Hanson	£385 0	W. Brown & Son	£349 10
Platford & Son	383 13	E. Plaistowe*	333 0
A. Jamieson	375 0		

SOUTHALL.—For new elementary school, for the Middlesex County County. Mr. H. G. Crothall, Architect to the Education Committee:—

Tennant & Co.	£15,722	H. Knight & Son	£12,484
W. Rice & Son	13,728	E. Lawrance & Son	12,446
C. F. Kearley	13,660	W. J. Dickens	12,390
G. Neal	13,050	A. & B. Hanson	12,328
G. Bollom	12,791	W. Lacey	11,899
W. Lawrence & Son	12,720	Mattock Bros.	11,820
A. Fairhead & Son	12,537	Treasure & Son, Ltd.‡	11,475
Fassnidge & Son	12,523		
Try & Hancock	12,493		

‡ Recommended for acceptance.

STANHOPE.—For sewage-disposal works, for the Urban District Council. Mr. J. S. Parker, A.M.Inst.C.E., Post Office-chambers, St. Nicholas-square, Newcastle-on-Tyne. Quantities by Mr. J. R. Ridley, Surveyor, Town Hall, Stanhope:—
J. Robson, Chillingham-road, Newcastle-on-Tyne* £2,097 14

SUNNINGDALE. — For the erection of four new cottages on the Ridge Mount Estate, for Mr. G. T. Wills. Messrs. T. Leonard Roberts & Co., architects and surveyors, Sunningdale:—
J. H. Wakelin, Sunningdale £1,110
[Lowest of four.]

SWANSEA.—For rebuilding Nos. 24, 25, and 26, Waterloo-street, for Messrs. Pergsley & Son. Mr. C. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—
H. Billings, Swansea* £1,400

TAUNTON. — For works of floods prevention at Sherford, for the Town Council. Mr. D. Edwards, A.M.Inst.C.E., Borough Engineer, Municipal-buildings, Taunton:—

G. Pollard & Co.	£125 0 0	E. G. Coles	£87 2 6
F. Small	105 0 0	J. Y. Coles	83 0 0
Moggridge & Son	104 5 0		

TEDDINGTON.—For redecoration of the Stanley-road Council school, for the Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee:—

T. W. Thomas	£464	Harding & Son	£385
J. F. Collinson	445	W. Rice & Son*	338

WOOTTON BASSETT.—For a covered service tank, etc., Coxstalls, for Cricklade and Wootton Bassett Rural District Council. Mr. F. Redman, Engineer, 34, Wood-street, Swindon, Wilts:—

Davis Bros. & Co., Ltd.	£859 0 0
Butler & Co., Ltd.	817 2 0
Whessoe Foundry Co., Ltd.	712 0 0
Newton, Chambers, & Co., Ltd.	681 0 8
H. Flewelling	678 5 9
J. Thompson	667 2 6
Piggott & Co., Ltd.‡	661 9 2
E. C. & J. Keay, Ltd.	647 0 0
Phœnix Foundry Co., Ltd.	646 12 2
C. & W. Walker, Ltd.	640 0 0
Cleveland Bridge and Engineering Co., Ltd.	637 0 0
Holmes & Co.	636 17 6
Piggott & Co., Ltd.§	620 11 8
Goddard, Massey, & Warner	601 15 4
Gibbons Bros., Ltd.	576 12 0
Cockey & Sons, Ltd., Frome*	518 10 0
Westwood & Wrights‖	512 0 0

‡ Riveted plates. § Pressed plates.
‖ Pressed sides and ends.

TIRPHIL Glam.).—For the erection and completion of footings, etc., for a new temporary school at Tirphil, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—
W. Williams & Sons, New Tredegar* £830

TIRPHIL (Glam.).—For the erection and completion of superstructure for a new temporary school at Tirphil, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—
W. Williams & Sons, New Tredegar* £573

UXBRIDGE.—For redecoration of the Uxbridge County school, for the Middlesex County Council. Mr. H. G. Crothall, Architect to the Education Committee:—

W. Portsmouth	£248 10	Try & Hancock*	£197 5
Fassnidge & Son	240 0		

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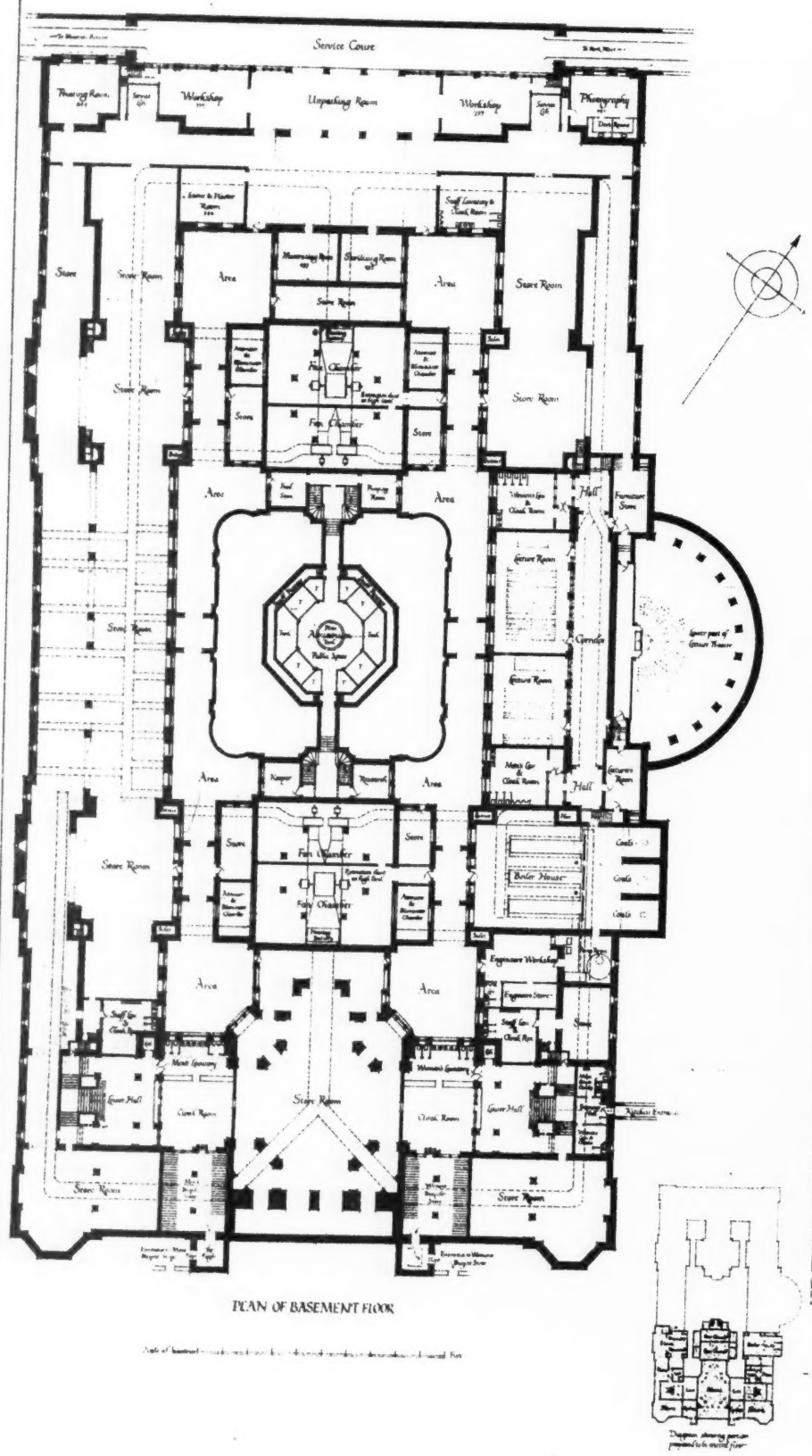
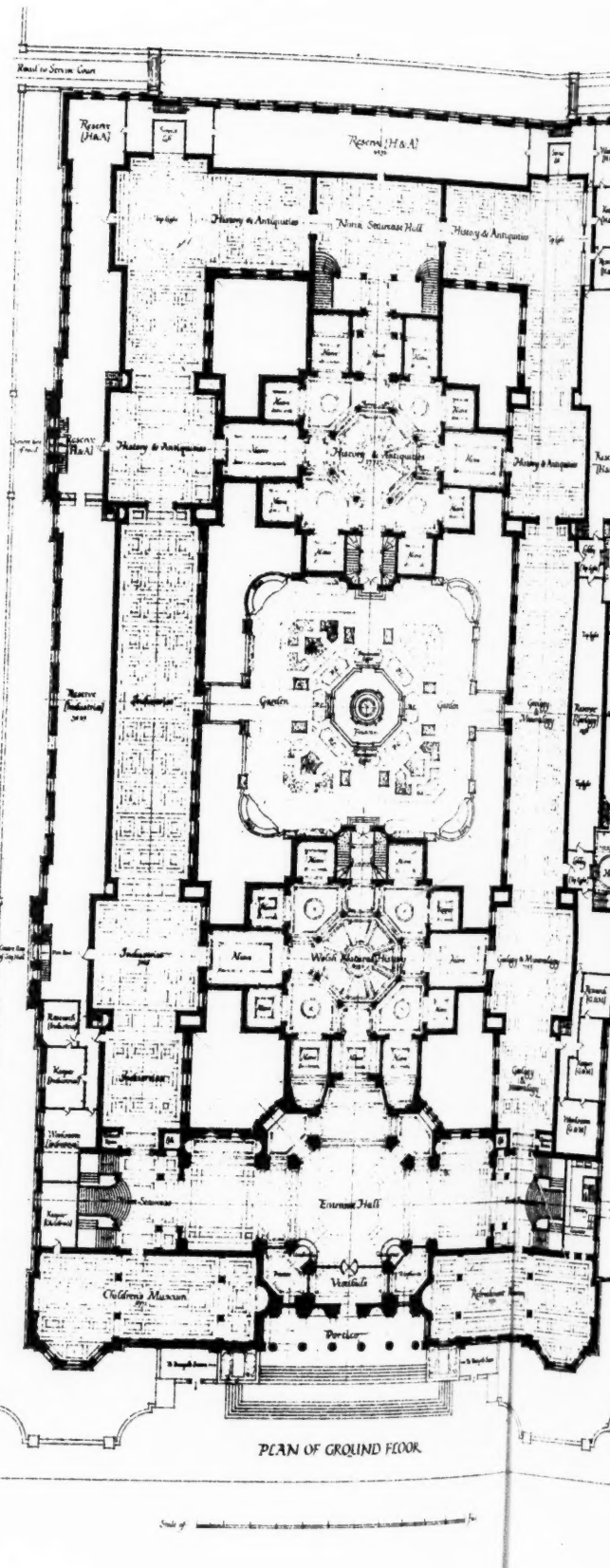


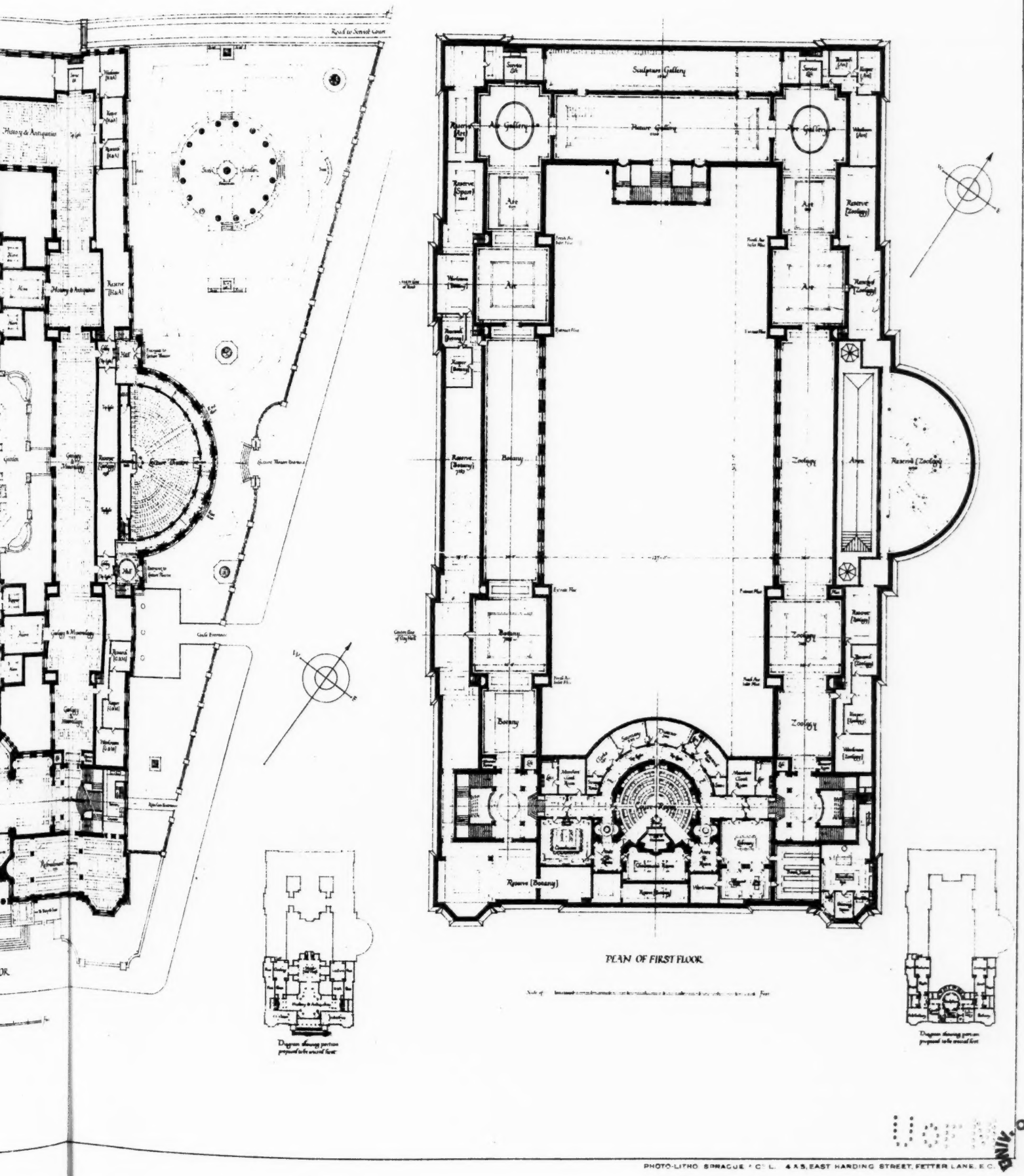
PLAN OF BASEMENT FLOOR



PLAN OF GROUND FLOOR

ACCEPTED DESIGN FOR NATIONAL MUSEUM, CARDIFF.—M

PLANS.


Road to Sewage Works
Sculpture Gallery
Art Gallery
Nature Gallery
Art Gallery
Reserve (Art)
Reserve (Sculpture)
Reserve (Zoology)
Art
Art
Art
Art
Reserve (Botany)
Botany
Botany
Botany
Zoology
Zoology
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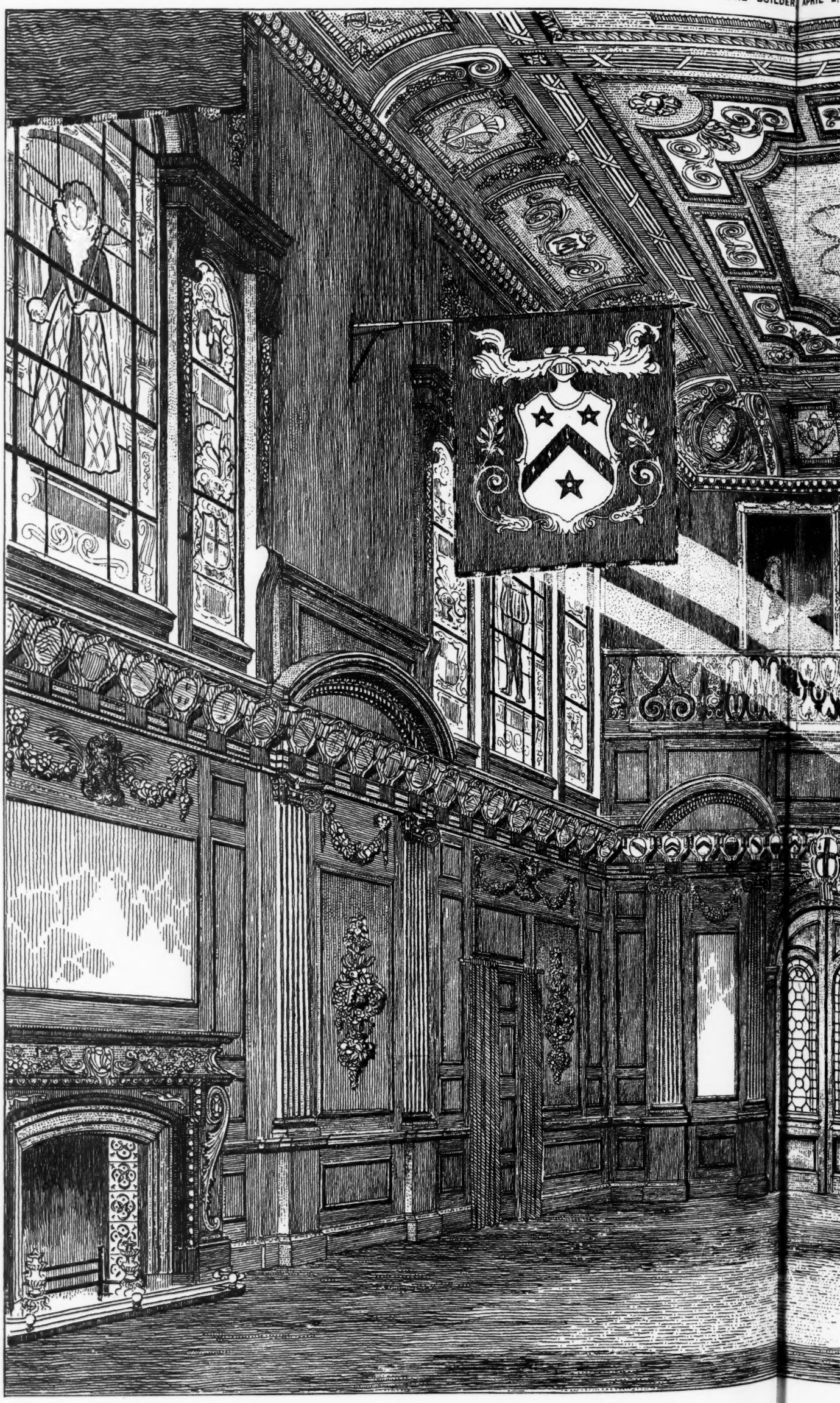
Reserve (Art)
Reserve (Art)
Reserve (Art



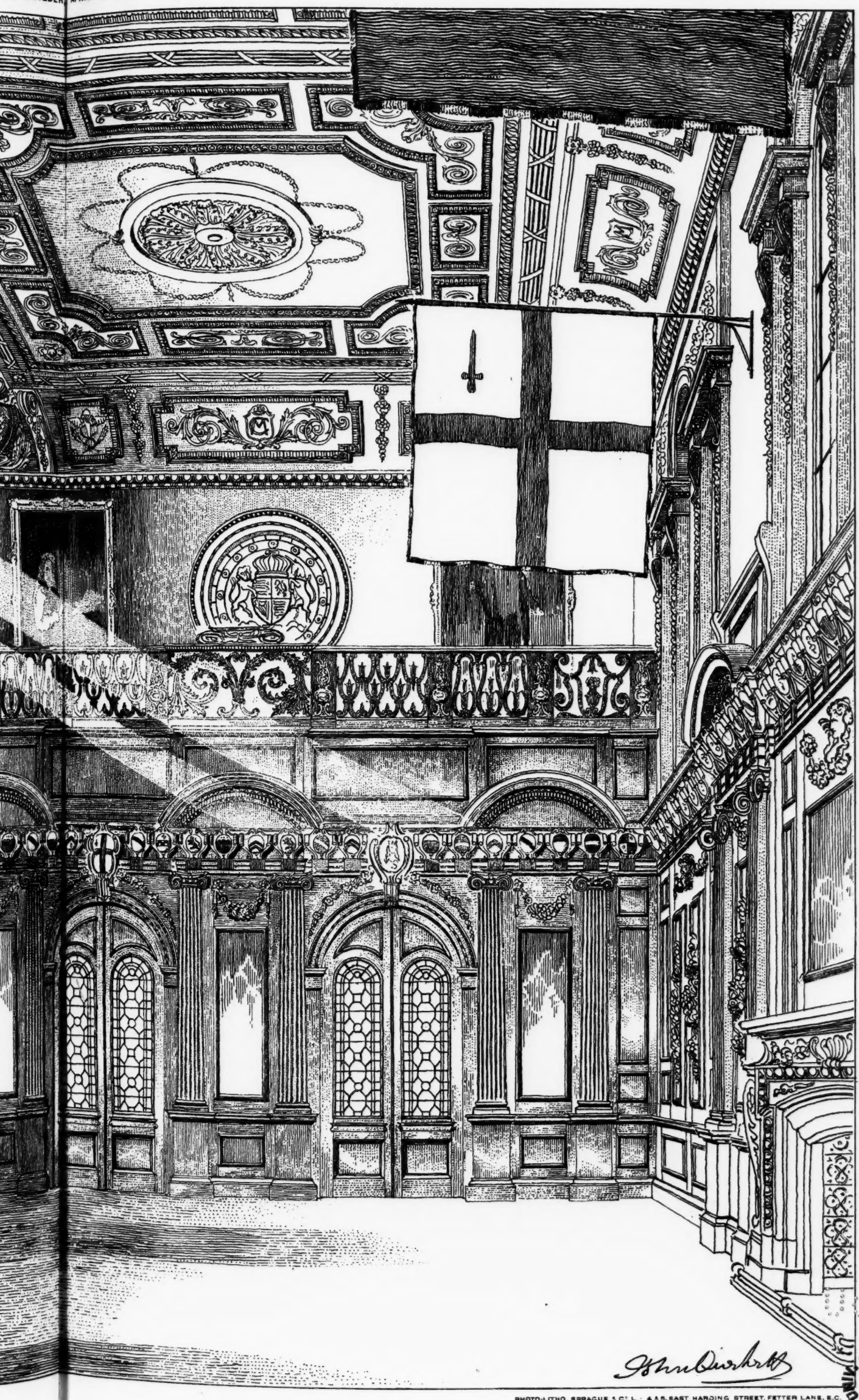
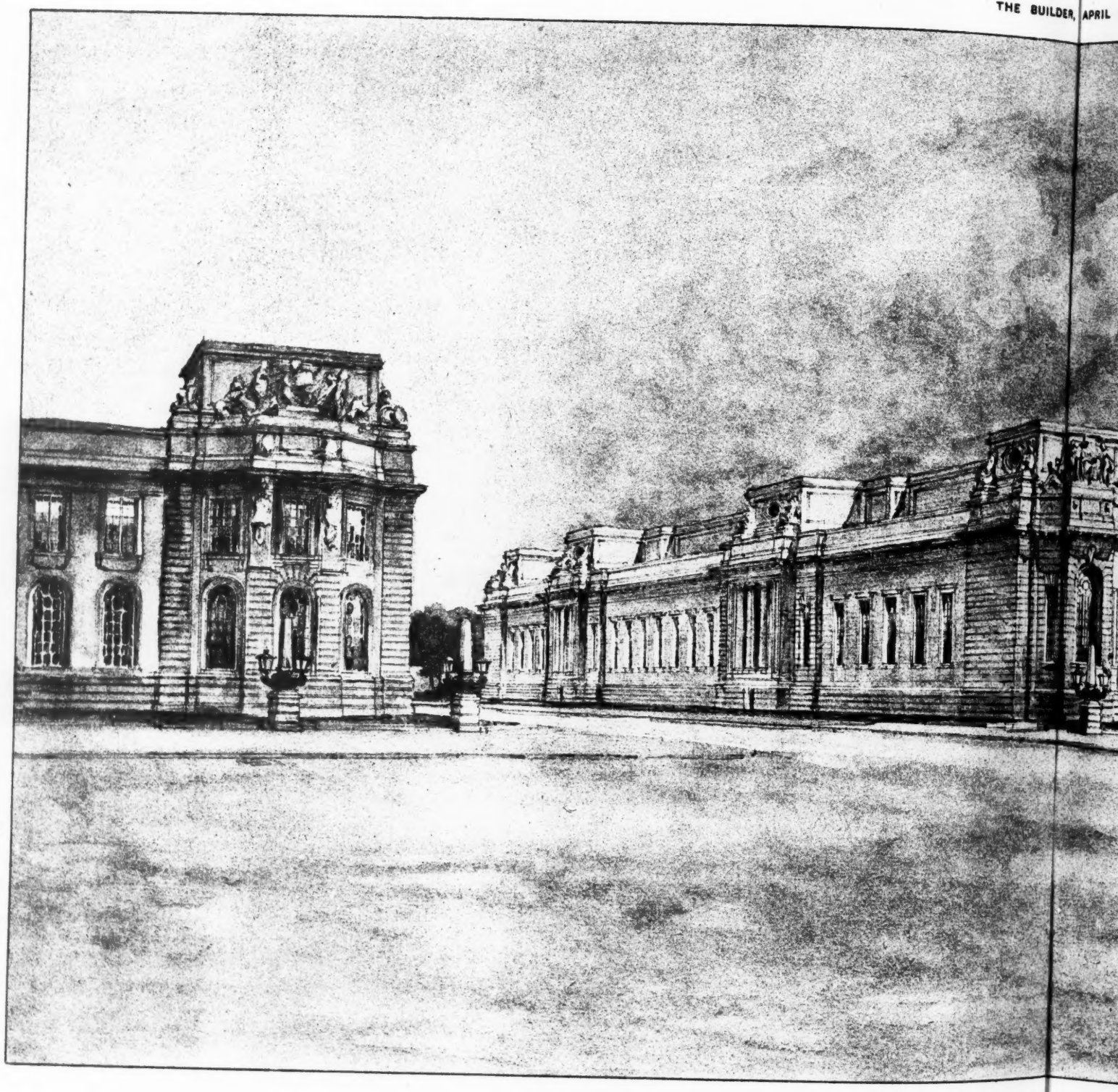


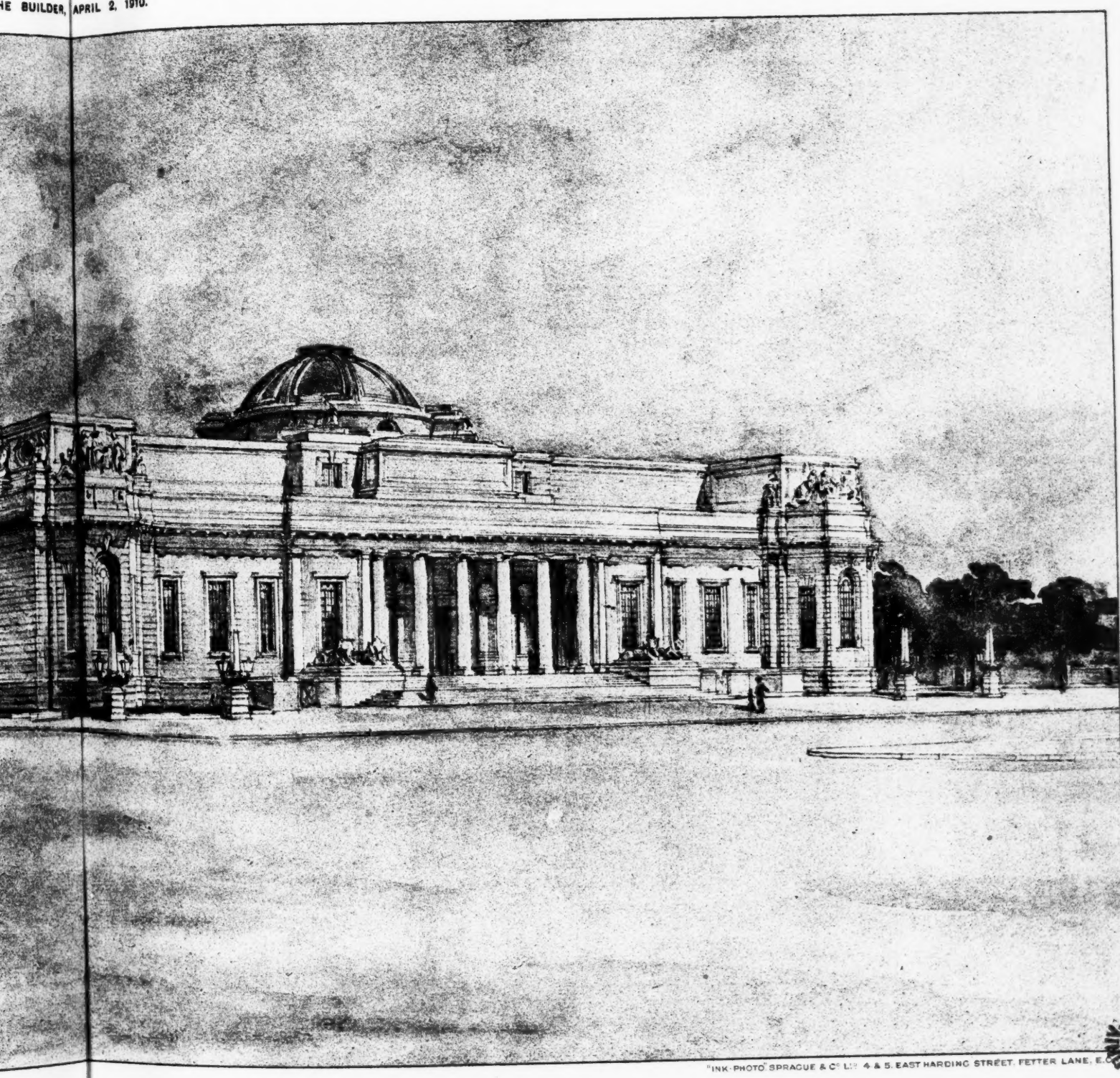
PHOTO-LITHO. SPRAGUE & Co. L.D. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

CITY COMPANIES: III.—MERCERS' HALL.



ACCEPTED DESIGN FOR NATIONAL MUSEUM, CARDIFF

PERSPECTIVE VIEW.



"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

UNIV. OF MICH.

ONAL MUSEUM, CARDIFF.—MESSRS. SMITH & BREWER, ARCHITECTS.

PERSPECTIVE VIEW.